TM E 11-227

WAR DEPARTMENT TECHNICAL MANUAL

SIGNAL COMMUNICATION EQUIPMENT DIRECTORY

GERMAN RADIO COMMUNICATION EQUIPMENT

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WAR DEPARTMENT • JUNE 1944

SIGNAL COMMUNICATION
EQUIPMENT DIRECTORY

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United States Government Printing Office
Washington: 1944

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WAR DEPARTMENT
Washington 25, D. C., 30 Jun 1944

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Chief of Staff.

OFFICIAL:
J. A. ULIO,
Major General,
The Adjutant General.

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IR 4: T/O 4-51; 4-61.

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IBn 2: T/O 2-25.

IBn 3: T/O 3-25.

IBn 5: T/O 5-15.

IBn 6: T/O 6-75.

IBn 7: T/O 7-15; 7-25.

IBn 8: T/O 8-75.

IBn 11: T/O 11-15; 11-95.

IBn 17: T/O 17-85; 17-85S.

IBn 19: T/O 19-55.

IBn 44: T/O 44-135.

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IC 2: T/O 2-10-1; 2-22; 2-67; 2-79.

IC 3: T/O 3-17; 3-267.

IC 4: T/O 4-104.

IC 5: T/O 5-16; 5-87; 5-192; 5-227; 5-218; 5-500.

IC 6: T/O 6-10-1; 6-12; 6-26; 6-29; 6-36; 6-39.

IC 7: T/O 7-19; 7-37.

IC 8: T/O 8-37; 8-27.

IC 11: T/O 11-7; 11-47; 11-57; 11-77; 11-97; 11-107; 11-127; 11-200-1; 11-327; 11-500; 11-517S; 11-537S; 11-557; 11-587; 11-592; 11-597.

IC 17: T/O 17-22; 17-80-1; 17-98S.

IC 18: T/O 18-10-1; 18-27.

IC 19: T/O 19-36.

IC 44: T/O 44-10-1; 44-12; 44-117; 44-127; 44-316; 44-327.

For explanation of symbols, see FM 21-6.

SIGNAL COMMUNICATION EQUIPMENT DIRECTORY - GERMAN RADIO COMMUNICATION EQUIPMENT

THIS MANUAL PRESENTS, IN A SINGLE VOLUME, A CONDENSATION AND COMPILATION OF DATA AVAILABLE AT THE PRESENT TIME PERTAINING TO GERMAN RADIO COMMUNICATION EQUIPMENT. IT IS ISSUED IN LOOSE LEAF FORM, SO THAT ADDITIONAL SHEETS OR REVISIONS OF OLD SHEETS CAN BE ADDED.

THIS MANUAL SUPERSEDES THE GERMAN SECTION OF THE SIGNAL COMMUNICATION EQUIPMENT DIRECTORY, 1943 ISSUE (SECTION 4: AXIS NATIONS, PART 1: GERMANY) PUBLISHED BY THE CHIEF SIGNAL OFFICER.

THE TABLE OF CONTENTS IN FRONT OF THE VOLUME LISTS THE VARIOUS ITEMS OF GERMAN RADIO COMMUNICATION EQUIPMENT DESCRIBED BY FUNCTIONAL GROUPS, SHOWING PAGE NUMBERS; AND THE INDEX IN THE BACK OF THE VOLUME LISTS ALL ITEMS OF EQUIPMENT DESCRIBED, IN ALPHABETICAL AND NUMERICAL ORDER, WITH PAGE NUMBERS, THUS PROVIDING A CROSS INDEX FOR READY REFERENCE.

THE FOLLOWING GERMAN ABBREVIATIONS AND SYMBOLS ARE USED IN THIS MANUAL:

E - EMPFANGER (RECEIVER)
FU - "COLLECTION OF EQUIPMENT", SIMILAR TO MEANING OF SCR.
S - SENDER - (TRANSMITTER)
SE - TRANSCEIVER
"A" - "B" - "C" - "D", ETC. INDICATE TYPES OR MODELS.

(ALL ENEMY TECHNICAL INTELLIGENCE CONTAINED HEREIN IS BASED ON LATEST DATA AVAILABLE 1 JUNE 1944.)

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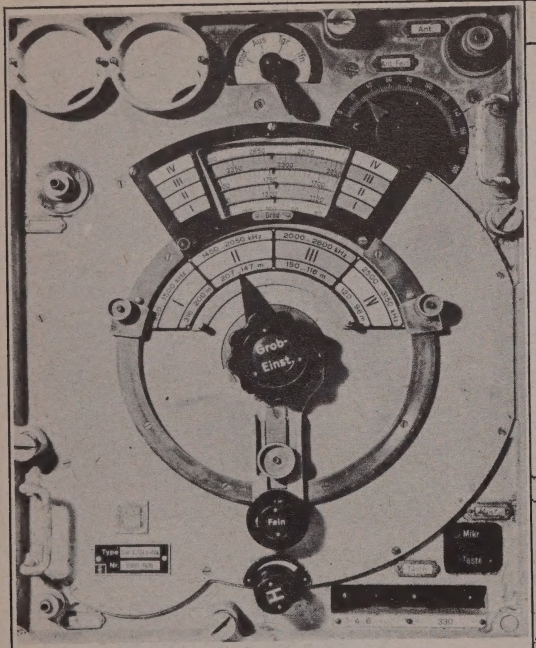
INSTRUCTIONAL LITERATURE: TB SIG E6

NOMENCLATURE DESIGNATION: (GROUND TRANS.) 5W.S./24b-104



5 W.S./24b - 104 (GROUND TRANS.) - FRONT VIEW

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 0.95-3.15 IN 4 BANDS AS FOLLOWS: 0.95-1.5; 1.45-2.05; 2.0-2.6; 2.5-3.15. THE FOUR BANDS ARE COLOR CODED FOR BOTH THE BAND SWITCHING AND TUNING DIALS.

NUMBER OF CRYSTALS: NONE

PRESET FREQUENCIES: 2. (ADJUSTABLE MECHANICAL STOPS LIMIT THE ROTATION OF THE TUNING MECHANISM).

ANTENNA: HORIZONTAL WIRE AND COUNTERPOISE OF 50 FEET; VEHICULAR ROD; EMERGENCY ANTENNA OF BARE WIRE, OR FIELD CABLE OF FROM 30 TO 90 FEET AND COUNTERPOISE CABLE OF FROM 45 TO 60 FEET.

TUNING: (MO OR CRYSTAL) MO. THE TUNING DIAL HAS A GRADUATED SCALE OF 0 TO 200 AND 4 SCALE DIVISIONS CALIBRATED IN KILOCYCLES WHOSE COLOR CODES AGREE WITH THOSE OF THE BAND SWITCH.

SENSITIVITY: SELECTIVITY:

POWER SOURCE: PEDAL GENERATOR, MOTOR CAR STORAGE BATTERY AND DYNAMOTOR U-5AL, OR GASOLINE MOTOR GENERATOR, DEPENDING UPON THE UNIT TO WHICH IT IS ISSUED. POWER REQUIREMENTS: FOR FILAMENT, 3.8 VOLTS AT 1.2 AMPERES; FOR PLATE 300 TO 330 VOLTS AT 0.14 AMPERE.

SIMILAR SETS: SCR-284A.

POWER OUTPUT: (WATTS) 5 TO 7

TUBES: (TYPE AND NUMBER) 2 RS 241 (TRIODES) USED AS MASTER OSCILLATOR AND POWER AMPLIFIER.

TACTICAL CHARACTERISTICS

USE: IN DIVISIONAL AND REGIMENTAL NETS OF THE GERMAN ARMY; IT MAY BE EMPLOYED FOR BOTH VEHICULAR AND GROUND OPERATION. IT IS USED WITH PORTABLE RECEIVERS SPEZ 445 BS OR TORN. E. B. IT CAN BE OPERATED WHILE ON THE MOVE. IT COULD BE USED IN NETS WITH AMERICAN AMPLITUDE-MODULATED RADIO SETS WITHIN THE FREQUENCY AND DISTANCE RANGE.

TYPE OF SIGNAL: CW AND VOICE.

RANGE: MILES: CW, APPROXIMATELY 36; VOICE, APPROXIMATELY 10.

TO COMMUNICATE WITH: 30 W.S. AND 80 W.S. AND OTHER SETS WITHIN THE FREQUENCY AND DISTANCE RANGE.

TO REPLACE IN PART:

TRANSPORTATION: VEHICULAR OR PACK (FOUR MEN).

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
TRANSMITTER KNAPSACK	18"	14 1/8"	7 5/8"	52 #
RECEIVER KNAPSACK	18"	14 1/8"	8 1/2"	48 1/2 #
PEDAL GENERATOR	35 1/8"	19 1/8"	12 1/4"	40 #
ENGINE GENERATOR SET	14"	16"	11"	53 #
COMBINED WEIGHT OF COMPONENTS:				

REMARKS

A GENERAL-PURPOSE, MEDIUM-FREQUENCY, LOW-POWER TRANSMITTER, CARRIED IN CASE OF LIGHT METALLIC ALLOY, WITH CARRYING HANDLE ON TOP, WOODEN FOOT RESTS ON BOTTOM AND HOOKS AND RINGS AT REAR FOR ATTACHING HARNESS. FRONT COVER, FITTED WITH RUBBER STRIPPING FOR WATERPROOFING, IS FASTENED ON WITH 4 TENSION CLAMPS.

8 W.S. (GROUND TRANS.)

NOMENCLATURE DESIGNATION:

INSTRUCTIONAL LITERATURE:

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 1.0-3.0

NUMBER OF CRYSTALS: None

PRESET FREQUENCIES: Two

ANTENNA: 66-foot L antenna or 33-foot T antenna.

TUNING: (MO OR CRYSTAL) MO

SENSITIVITY: SELECTIVITY:

POWER SOURCE: Pedal generator, engine generator, or 12-volt battery and dynamotor. 350 volts at 75 mA; 12 volts at 1.25 amperes.

SIMILAR SETS: 5 W.S. and SCR-288.

POWER OUTPUT: (WATTS) 8. For CW, transmitter can be reduced to 1/4 power.

TUBES: (TYPE AND NUMBER) Two RL 12 T 15 MOPA, grid modulated.

TACTICAL CHARACTERISTICS

USE: For regimental command and reconnaissance nets. It could be used by our own troops in deception nets.

TYPE OF SIGNAL: CW and voice. Change over by means of "press-to-talk" in handset.

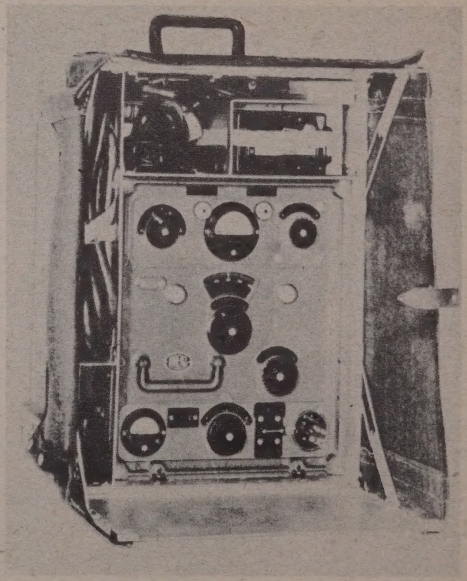
RANGE: (MILES)

TO COMMUNICATE WITH: A pack receiver similar to the transmitter in size and weight and covering 0.1-10.0 mc in 8 bands - such as Torn. E. 8 etc.

TO REPLACE IN PART:

TRANSPORTATION: Vehicular or pack-man or animal in 3 carrier loads.

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
Transmitter pack	20"	12"	11"	48 1/2 #
COMBINED WEIGHT OF COMPONENTS:				



8 W.S. (GROUND TRANS.) FRONT VIEW OF SET
(FROM LORENX CATALOG)

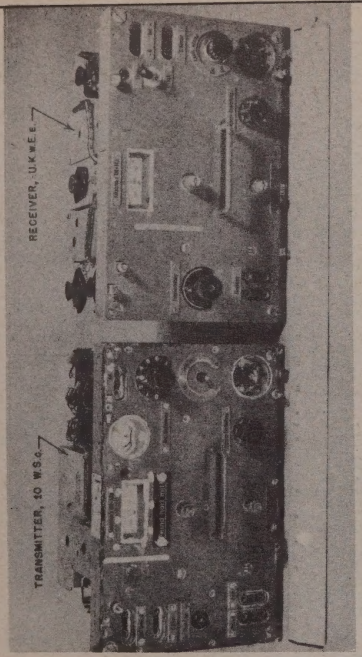
REMARKS

Transmitter, manufactured by Lorenz, a 1937-1938 design. Photograph from Lorenz catalog. Headphones, key and hand mike are carried in pack above transmitter.

Circuit: master oscillator, power amplifier, grid modulated in latter. Tuned by variometers.

INSTRUCTIONAL LITERATURE: TB SIG E5

NOMENCLATURE DESIGNATION: (GROUND TRANS. —TANK.) 10 W.S.c & 10W.S.h



10 W.S.c AND 10 W.S.h (GROUND TRANS. - TANK) SHOWING TRANSMITTER 10 W.S.c, AND RECEIVER U.K.W.E.E.

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 10 W.S. c 27.2-33.3 IN ONE BAND 10 W.S. h 23.0-24.95 IN ONE BAND. DIAL GRADUATION OF 10 W.S. c IN 50-KC INTERVALS, OF 10 W.S. h IN 40 FIXED WAVES NUMBERED FROM 241 THROUGH 280 AT 50-KC INTERVALS.

NUMBER OF CRYSTALS: NONE

PRESET FREQUENCIES: 2 CLICK STOPS

ANTENNA: 6½ FOOT ROD FOR USE ON THE MOVE. MAST SECTIONS PROVIDED FOR FIXED USE.

TUNING: (MO OR CRYSTAL) MO

SENSITIVITY: SELECTIVITY:

POWER SOURCE: 12-VOLT VEHICLE STORAGE BATTERY THROUGH DYNAMOTOR U-10Al. CURRENT DRAIN FROM 12-VOLT BATTERY IS 7.2 AMPERES (NORMAL) FOR TONE (KEY DOWN) OR VOICE; 4.5 AMPERES FOR TONE (KEY UP) AND 1.9 AMPERE FOR STANDBY. POWER REQUIREMENTS FOR FILAMENTS AND DIAL LAMP 12 VOLTS, 2 AMPERES; FOR PLATES 350 VOLTS AT 100 MILLIAMPERES.

SIMILAR SETS: SCR-508

POWER OUTPUT: (WATTS) 6.5 (NORMAL) AND 10 (MAXIMUM). MAXIMUM IS OBTAINED BY PRESSING RED PUSH-BUTTON SWITCH MARKED "OBERSTRICH" (POWER INCREASE); USED WHEN ALIGNING ANTENNA AND IN EMERGENCIES.

TUBES: (TYPE AND NUMBER) 3-- ONE RV 12 P4000 (MODULATOR AND TONE-OSCILLATOR) AND TWO RL 12 P35 (MASTER OSCILLATOR AND POWER AMPLIFIER).

TACTICAL CHARACTERISTICS

USE: IN ARMORED VEHICLES FOR SHORT DISTANCES; IN TANKS GENERALLY FOR COMMUNICATION BETWEEN TANK COMPANY AND TANK BATTALION HEADQUARTERS; AND IN STATIONARY INSTALLATIONS FOR SHORT RANGE COMMUNICATION WITH MARINE STATIONS. THESE TRANSMITTERS CAN ALSO BE USED IN NETS WITH AMERICAN AMPLITUDE-MODULATED SETS WITHIN THE FREQUENCY AND DISTANCE RANGE. THEY WERE DESIGNED TO BE USED WITH RECEIVERS Ukw. E. E AND Ukw. E. H.

TYPE OF SIGNAL: TONE OR VOICE-MODULATED SIGNALS (A-M); NO PROVISION FOR CW OPERATION.

RANGE: (MILES) TONE: STATIONARY 4, MOVING 3; VOICE: STATIONARY 3, MOVING 1½.

TO COMMUNICATE WITH: 10 W.S. c COMMUNICATES WITH 20 W.S. c AND OTHER 10 W.S. c's; 10 W.S. h COMMUNICATES WITH OTHER 10 W.S. h's AND FUSPRECH. A.

TO REPLACE IN PART:

TRANSPORTATION: IN TANKS AND ARMORED CARS.

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
TRANSMITTER	7 1/2"	12 1/2"	7 "	22 #
RECEIVER (U.K.W.E.)	7 1/2"	12 1/2"	7 "	27 #
POWER SUPPLY U10A 1	3 1/2"	6 "	8 "	23 1/2 #
POWER SUPPLY E. U A 2	3 1/2"	4 "	6 "	14
COMBINED WEIGHT OF COMPONENTS:				

REMARKS

10 W.S. c AND 10 W.S. h ARE SIMILAR EXCEPT FOR CALIBRATION SCALE AND FREQUENCY RANGE. TRANSMITTER AND RECEIVER CHASSIS (RECEIVERS Ukw. E. E AND Ukw. E. H) ARE EACH CONTAINED IN STRONG CASE, COVER OF WHICH CLIPS ON TO FRONT PANEL. NO LUGS OR PROJECTIONS, SINCE MOUNTING ARRANGEMENTS ARE BUILT INTO THE TANKS.

ON TOP OF EACH CASE IS A PAIR OF BRASS STRIPS FOR GROUNDING PURPOSES. TWO CABLES PROVIDE NECESSARY CONNECTIONS BETWEEN TRANSMITTER AND RECEIVER--ONE FOR SIDETONE AND THE OTHER FOR THE ANTENNA. SOME MODELS ARE PROVIDED WITH AN INTERPHONE SYSTEM FOR INTERCOMMUNICATION BETWEEN MEMBERS OF THE TANK CREW. TELEFUNKEN PRODUCT.

15 W. S. E. a. (GROUND TRANS.-RECVR.)	NOMENCLATURE DESIGNATION:	INSTRUCTIONAL LITERATURE:

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 3.0-7.5 IN TWO BANDS.

NUMBER OF CRYSTALS: NONE

PRESET FREQUENCIES:

ANTENNA: THE TYPE OF ANTENNA USED DEPENDS UPON THE TACTICAL EMPLOYMENT OF THE UNIT. HIGH ROD ANTENNA WITH COUNTERPOISE OR VEHICLE ROOF ANTENNA.

TUNING: (MO OR CRYSTAL) MO.

SENSITIVITY: SELECTIVITY:

POWER SOURCE: PEDAL GENERATOR TYPE 15A AND RECTIFIER WITH STORAGE BATTERY 2.4 NO 58; 12-VOLT STORAGE BATTERY IN VEHICLE WITH CONVERTER TYPE 15A AND RECTIFIER.

SIMILAR SETS:

POWER OUTPUT: (WATTS) APPROXIMATELY 15 WATTS.

TUBES: (TYPE AND NUMBER) TRANSMITTER: 3 RL 4.8 P 15 AND 1 RV 2.4 P 700; RECEIVER: 8 RV 2.4 P 700.

TACTICAL CHARACTERISTICS

USE: THIS UNIT IS USED BY THE ARTILLERY DIVISION COMMANDER DOWN TO THE LOWER UNITS.

TYPE OF SIGNAL: TWO-WAY CW AND VOICE TRANSMISSION.

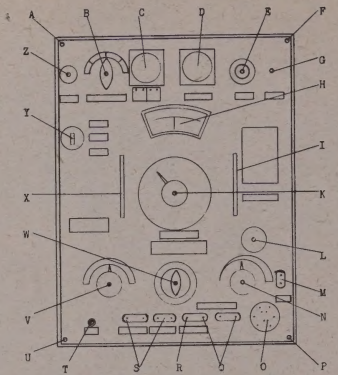
RANGE: (MILES) R/T, 20 MILES; W/T, 60. REMOTE OPERATION ON VOICE IS POSSIBLE UP TO 328.08 FEET BY USING REMOTE CONTROL UNIT "BF".

TO COMMUNICATE WITH:

TO REPLACE IN PART:

TRANSPORTATION: FIXED OR VEHICULAR.

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
TRANSMITTER-RECEIVER WITH COMBINED OPERATING PANEL IN ONE CONTAINER.				
TWO POWER SUPPLIES.				
ANTENNAS.				
REMOTE CONTROL UNIT.				
COMBINED WEIGHT OF COMPONENTS:				39.5 #



(A) FIXING SCREW
(B) FREQUENCY RANGE SWITCH
(C) VOLTMETER
(D) ANTENNA AMMETER
(E) ANTENNA CONNECTION
(F) FIXING SCREW
(G) SUPPORTING PIN
(H) DIAL - FREQ. ADJUSTMENT
(I) HANDLE
(K) ANTENNA TUNING
(L) FREQ. ADJUSTMENT
(M) CONNECTION FOR KEY
(N) VOLUME CONTROL
(O) PLUG HOLDER
(P) FIXING SCREW
(Q) CONNECTION - REMOTE CONTROL
(R) CONNECTION - MICROPHONE
(S) CONNECTION - HEADPHONES
(T) CONNECTION - COUNTERPOISE
(U) FIXING SCREW
(V) RECEIVER FINE TUNING
(W) OPERATING SWITCH
(X) HANDLE
(Y) NOTE FILTER SWITCH
(Z) RECEIVER TUNING BUTTON

15 W. S. E. - (GROUND TRANS.-RECVR)

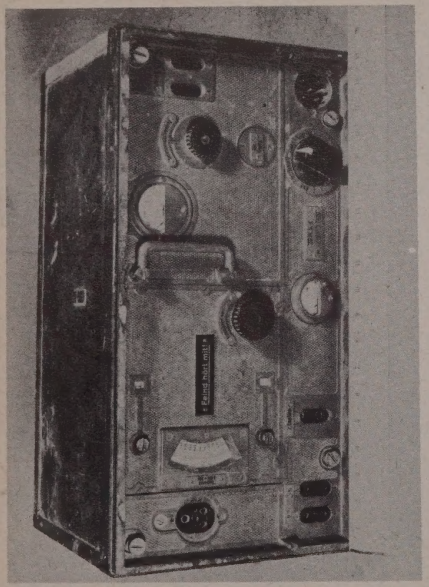
REMARKS

THE 15 W.S.E.A CONSISTS OF A TRANSMITTER-RECEIVER WITH COMBINED OPERATING PANEL HOUSED IN ONE CONTAINER, TWO POWER SUPPLIES, ANTENNAS AND REMOTE CONTROL UNIT. FREQUENCY ADJUSTMENT IS COMMON TO TRANSMITTER AND RECEIVER WHICH ARE ALWAYS ON THE SAME FREQUENCY. RECEIVER FINE TUNING MUST ALWAYS BE DONE BY KNOB "EMPFANGER-NACHSTIMMUNG" (RECEIVER FINE TUNING) NEVER BY KNOB "FREQUENZEINSTELLUNG" (FREQUENCY SETTING). WHEN TUNING THE TRANSMITTER EITHER IN THE "Te" OR "Tn" POSITION, THE TRANSMITTER MUST BE FIRST EXCITED BY PRESSING, EITHER THE KEY OR THE MICROPHONE BUTTON. WHEN TRANSMISSION IS OF LONG DURATION, THE OPERATING SWITCH SHOULD BE SET TO "SENDEN TG" FOR CW OR TO "SENDEN TN" FOR VOICE. THIS IS DONE TO SAVE CURRENT BY SHUTTING OFF THE RECEIVER LIKEWISE, DURING LONG PERIODS OF RECEPTION, THE TRANSMITTER CAN BE SHUT DOWN BY SETTING THE OPERATING SWITCH TO "EMPFANG TN" OR "EMPFANG Te". AS A SECURITY MEASURE, IT IS POSSIBLE TO TUNE THE ANTENNA WITHOUT CAUSING IT TO RADIATE.

24-79088&RCD-76

INSTRUCTIONAL LITERATURE: TB SIG 68

NOMENCLATURE DESIGNATION: (GROUND TRANS. —VEHICULAR.) 20 W.S. c & 20 W.S. d



20 W.S. D, (GROUND TRANS. - VEHICULAR) FRONT VIEW.

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 20 W.S.c 27.2-33.3; 20 W.S. D 42.1-47.8

NUMBER OF CRYSTALS: None

PRESET FREQUENCIES: Two with click stop settings.

ANTENNA: Variable - 4½ to 6½ feet whip or umbrella.

TUNING: (MO OR CRYSTAL) MO

SENSITIVITY: SELECTIVITY:

POWER SOURCE: Dynamotor U-20A, U-20A2 or U-20A3 connected to 12-volt battery. Power requirements for filament 12 volts, 2.75 amperes, ammroximately; for plate 370 volts, 130 milliamperes approximately.

SIMILAR SETS: 20 W.S.B and American BC-307 and BC-684

POWER OUTPUT: (WATTS) 20

TUBES: (TYPE AND NUMBER) 5-all RL 12 T15, used as master oscillator, doubler, power amplifier (2 tubes) modulator and tone oscillator (1 tube).

TACTICAL CHARACTERISTICS

USE: 20 W.S. C is used in tank regiment net, tank-to-tank and tank-to-rear. 20 W.S. D is used as tank regiment command set for tank-to-tank and tank-to-air.

TYPE OF SIGNAL: Tone (800 to 1000 cycles) and voice (amplitude modulated)

RANGE: (MILES) 20 W.S. c - tone 5, voice 3. 20 W.S. D tone 50, voice 30.

TO COMMUNICATE WITH: 20 W.S. C communicates with 10 W.S.C used in tank battalion, the receiver used being Ukw. E. C. 20 W.S. D provides two-way connection with airborne set FuG 16, the receiver used being Ukw. E. D[1]

TO REPLACE IN PART:

TRANSPORTATION: 20 W.S.C is mounted in tanks and armored cars of battalions. 20 W.S.D is mounted in regiment staff armored cars.

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
20 W. S. C	19"	8½"	10"	30 #
20 W. S. D	19"	8½"	10"	36 #
COMBINED WEIGHT OF COMPONENTS:				

REMARKS

These two sets are identical except for frequency range. They are amplitude-modulated transmitters, well designed both electrically and mechanically, with excellent frequency stability and affording dependable voice and tone communication. Sidetone is present on both voice and tone.

The quality of voice modulation is excellent; tone is remarkably free from chirps and clicks. Both sets are easy to operate.

DMG 4K / DMG 5K (GROUND TRANS.)

NOMENCLATURE DESIGNATION:

INSTRUCTIONAL LITERATURE:

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) DMG 4K 500-560; DMG 5K 500-600. A CALIBRATED FREQUENCY METER BUILT INTO TRANSMITTER PERMITS IT TO BE SET TO ANY FREQUENCY WITHIN ITS OPERATING RANGE.

NUMBER OF CRYSTALS:

PRESET FREQUENCIES:

ANTENNA: TWO IDENTICAL, BROAD-BAND, DIRECTIONAL ANTENNA ARRAYS - ONE FOR TRANSMITTING AND THE OTHER FOR RECEIVING. DMG 4K CONSISTS OF 3 ROWS OF 4 DIPOLES EACH AND DMG 5K OF 2 ROWS OF 5 DIPOLES EACH. DIPOLES AT BOTH STATIONS SHOULD BE PLACED IN THE SAME DIRECTION I.E. BOTH VERTICAL OR BOTH HORIZONTAL.

TUNING: (MO OR CRYSTAL)

SENSITIVITY: SELECTIVITY:

POWER SOURCE: 220 VOLTS A-C SUPPLY. IN A CAPTURED DMG 5K, POWER WAS SUPPLIED BY A 220-VOLT, 50-CYCLE, GASOLINE-DRIVEN ALTERNATOR.

SIMILAR SETS: DMG 4K AND DMG 5K ARE PRACTICALLY THE SAME SET, THE LATTER BEING A LATER MODEL.

POWER OUTPUT: (WATTS) OUTPUT IS NOT KNOWN EXACTLY BUT IS BELIEVED TO BE 0.5-1.0 WATTS.

TUBES: (TYPE AND NUMBER) DUO-DIODE ACORN TYPE TUBES - RL 12 T1 - USED IN ALL R-F SECTIONS OF TRANSMITTER AND RECEIVER OF BOTH THE DMG 4K AND DMG 5K.

TACTICAL CHARACTERISTICS

USE: THESE SETS ARE USED FOR MULTICHANNEL COMMUNICATION OVER LIMITED DISTANCES. THEY COULD BE USED BY OUR OWN TROOPS IN CHAINS SIMILAR TO OUR FREQUENCY-MODULATED TELETYPE STATIONS; THEY WOULD HAVE THE ADVANTAGE OF PROVIDING SIMULTANEOUS RADIOTELEPHONE COMMUNICATION.

TYPE OF SIGNAL: VOICE AND TONE

RANGE: (MILES) LIMITED--QUASI-OPTICAL--ROUGHLY, 30 TO 60 MILES. MUCH GREATER RANGES CAN BE SECURED BY THE INTRODUCTION OF RELAY STATION LOCATED ON HIGH POINTS BETWEEN STATIONS. SIGHTING THE ANTENNAS OF BOTH STATIONS ON HIGH POINTS WITHOUT INTERVENING OBSTRUCTIONS ALSO INCREASES THE RANGE.

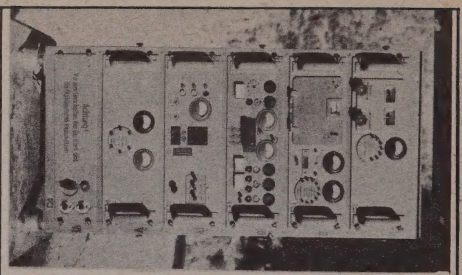
TO COMMUNICATE WITH: ADJACENT STATIONS - OR REPEATERS.

TO REPLACE IN PART:

TRANSPORTATION: FIXED INSTALLATION.

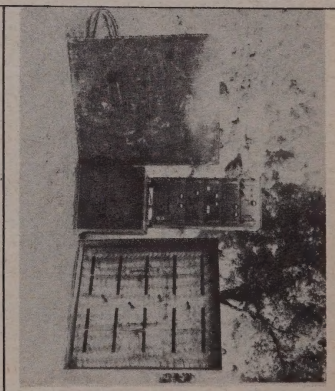
DMG 4K & DMG 5K (GROUND TRANS.)

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
OVER-ALL WEIGHT OF DMG 5K COMPLETE WITH ANTENNAS, RACK, AND ALL SECTIONS IS ESTIMATED TO BE 900 #				
RACK	46"	20 1/2"	12 1/2"	
BASE	25 1/2"	26 "	20 "	
CASES FOR ANTENNAS	56 "	51 "	10 "	
OVER-ALL HEIGHT OF RACK ON BASE 72 1/2 "				
COMBINED WEIGHT OF COMPONENTS:				900 #



(ABOVE) COMPLETE SET WITH ARRAYS. RIGHT HAND ARRAY HAS FRONT PANEL REMOVED. DIPOLES ARE TAPED BLACK FOR PHOTOGRAPHIC PURPOSES.

(LEFT) CABINET MOUNTED ON BASE, SHOWING SIX SECTIONS.



REMARKS

FOR OPERATING EITHER OF THE DECIMETER RADIO SETS -- DMG 4K (MICHAEL II) AND DMG 5K (MICHAEL IIR) - TWO STATIONS ARE REQUIRED, EACH EQUIPPED WITH TRANSMITTER, RECEIVER, ANTENNA ARRAYS, POWER AMPLIFIERS, POWER SUPPLY AND SUCH AUXILIARY EQUIPMENT AS MICROPHONES, HEADSETS, KEYS, TELETYPE MACHINES ETC. THE TRANSMITTER OF STATION "A" AND THE RECEIVER OF STATION "B" ARE ADJUSTED TO THE SAME FREQUENCY, AND THE TRANSMITTER OF "B" IS ADJUSTED TO THE SAME FREQUENCY AS THE RECEIVER OF "A", BUT THE TWO FREQUENCIES ARE AS WIDELY SEPARATED AS POSSIBLE WITHIN THE LIMITS OF FREQUENCY.

TO INCREASE THE RANGE, RELAY STATIONS, EACH HAVING 2 SETS, MAY BE SET UP BY WHICH IT IS POSSIBLE FOR SIGNALS TO BE RECEIVED FROM BOTH END STATIONS AND RETRANSMITTED ON DIFFERENT FREQUENCIES. THE WIRELESS NETWORK THUS ESTABLISHED WILL BE SECURE FROM INTERCEPTION OUTSIDE THE BEAM AREA.

A SET IS INCLOSED IN A CABINET WITH 6 DRAWERS CONTAINING TRANSMITTER AND FREQUENCY METER; R-F UNIT OF RECEIVER; A-F UNIT OF RECEIVER; MICROPHONE AND KEY EQUIPMENT; OUTSIDE POWER CONNECTIONS AND POWER UNIT AND CONNECTING BLOCK. TRANSMITTER, IN TOP COMPARTMENT, PROVIDES 2 CHANNELS OF COMMUNICATION OVER A SINGLE CARRIER.

CHANNEL I MAY BE MODULATED BY FREQUENCIES FROM 300-2400 c/s (USED FOR RADIOTELEPHONY); CHANNEL II, MODULATED BY 2 TONES (ONE OF 6 AND THE OTHER OF 8 kc/s) IS USED FOR ALL TYPES OF RADIOTELEGRAPHY INCLUDING RADIOTELETYPE. THE CALL SIGNAL OF THE RECEIVER IS ACTUATED BY A PULSE SENT OVER CHANNEL I. THE TRANSMITTER CIRCUIT, USING A DUO-DIODE WITH INDIRECTLY HEATED CATHODE (12.6 VOLTS A-C), OPERATES WITH ABOUT 80 VOLTS ON THE PLATES. THE TWO SECTIONS OPERATE IN PARALLEL AND ARE TUNED BY A COMBINATION CAPACITANCE AND LECHER SYSTEM. THE SECONDARY OF THE MODULATION TRANSFORMER IS CONNECTED IN SERIES WITH THE PLATE CIRCUIT OF THE TRANSMITTER. SUPERHETERODYNE RECEIVER, MOUNTED BELOW TRANSMITTER, USES A DUO-DIODE (PARALLEL OPERATED) AS DETECTOR AND HAS 5 STAGES OF I-F AND ONE STAGE OF A-F AMPLIFICATION. AUTOMATIC TUNING DEVICE ENABLES RECEIVER TO BE TUNED ALWAYS TO THE INCOMING SIGNAL. VOLTAGE STABILIZERS ARE PROVIDED FOR PLATE SUPPLY OF BOTH TRANSMITTER AND RECEIVER. LOCAL AND REMOTE CONTROL.

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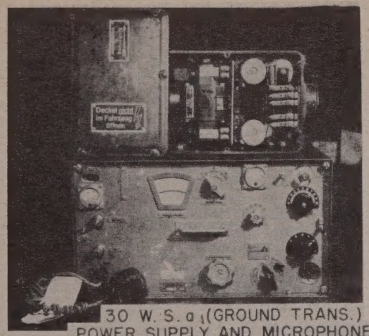
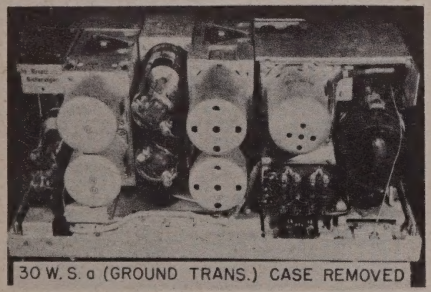


30 W. S. a (GROUND TRANS.)
POWER SUPPLY AND MICROPHONE



30 W. S. a (GROUND TRANS.) CASE REMOVED

INSTRUCTIONAL LITERATURE: TB Sig E 11

NOMENCLATURE DESIGNATION: (GROUND TRANS.) 30 W. S. a

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 1.1-3.01 IN 3 BANDS: 1.1-1.55 (YELLOW DIALS); 1.5-2.15 (RED DIALS) 2.13-3.01 (WHITE DIALS).

NUMBER OF CRYSTALS: ONE, USED IN CALIBRATING THE OSCILLATOR.

PRESET FREQUENCIES:

ANTENNA: VEHICULAR ROD OR ROOF ANTENNA; OPEN-WIRE ANTENNA; 30-FOOT TELESCOPIC MAST WITH STAR ON TOP.

TUNING: (MO OR CRYSTAL) MO. CALIBRATION OBTAINED BY CRYSTAL RESONATOR CUT TO RESONATE AT 771 KC/S.

SENSITIVITY: SELECTIVITY:

POWER SOURCE: DYNAMOTOR U-30B CONNECTED TO 12-VOLT BATTERY; 400 VOLTS, 175 MILLIAMPERES OUTPUT; 12 AMPERE DRAIN FROM 12-VOLT BATTERY INPUT.

SIMILAR SETS: 80 W.S.A. THESE TWO SETS ARE SIMILAR IN LAYOUT AND CIRCUIT ARRANGEMENT WITH ALMOST IDENTICAL COMPONENTS.

POWER OUTPUT: (WATTS) 30
TUBES: (TYPE AND NUMBER) 2 R1 12 P35; 2 RV 12 P2000; 1 RL 12 T15

TACTICAL CHARACTERISTICS

USE: BY SMALL SIGNAL UNITS AND SIGNAL TROOPS IN ARMORED UNITS. IT IS SUITABLE FOR USE BY OUR OWN TROOPS FOR COMMUNICATION FROM A VEHICLE OR AS A MEDIUM POWERED GROUND STATION. IT IS ALSO USEFUL FOR DISTANT CALIBRATION OF MEDIUM-FREQUENCY D/F STATIONS BETWEEN 1 AND 3 MC/S. THE APPROPRIATE RECEIVER IS MW.E.C ALTHOUGH TOWN. E. B CAN ALSO BE USED.

TYPE OF SIGNAL: TONE AND VOICE.

RANGE: (MILES) WITH 30-FOOT ANTENNA: 100 TONE, 31 (VOICE); WITH ROOF ANTENNA: (FIXED STATION) 31 TONE, 10 (VOICE). WITH ROOF ANTENNA (ON THE MOVE) 25 TONE, 6 (VOICE).

TO COMMUNICATE WITH: 80 W.S. AND OTHER SETS OF EQUAL STRENGTH AND FREQUENCY RANGE.

TO REPLACE IN PART: 30 W.S./2+8-120 WHICH IS BELIEVED TO BE OBSOLESCENT.

TRANSPORTATION: MOUNTED IN ARMORED CAR; IT MAY BE REASSEMBLED AND CARRIED IN A TANK.

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
TRANSMITTER (OVER-ALL)	19.1"	9.9"	9.2"	41.9#
COMBINED WEIGHT OF COMPONENTS:				

REMARKS

MEDIUM-POWER FIELD TRANSMITTER, HOUSED IN SHEET-METAL RAIN- AND DUST-PROOF CASE, CONSISTS OF A SELF-EXCITED, MASTER-OSCILLATOR STAGE WITH TUNED ANODE CIRCUIT, POWER AMPLIFIER, MODULATOR SECTION AND FREQUENCY CHECK UNIT. FOUR TUNED CIRCUITS IN PARALLEL. FOR SPEECH MODULATION, THE MODULATOR SECTIONS COMPRISES TWO TUBES CONNECTED IN PARALLEL. WHEN SWITCHED FOR CW WORKING, THE MODULATOR SECTION BECOMES A SELF-EXCITED TONE GENERATOR AND IS KEYED AT THE SAME TIME AS THE TRANSMITTER FOR SIDETONE PURPOSES.

30W.S./24b-120 (GROUND TRANS.)

NOMENCLATURE DESIGNATION:

INSTRUCTIONAL LITERATURE:

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 0.95-1.68. A movable stop at each end of the dial permits quick shifting of frequency.

NUMBER OF CRYSTALS: None

PRESET FREQUENCIES: None

ANTENNA:

TUNING: (MO OR CRYSTAL) MO

SENSITIVITY: SELECTIVITY:

POWER SOURCE: U-30a dynamotor operated from 12-volt battery.

SIMILAR SETS: 30 W.S. and 80 W.S.

POWER OUTPUT: (WATTS) 30

TUBES: (TYPE AND NUMBER) Five RS 241, one L.E.W. or Kolben (ballast tube)

TACTICAL CHARACTERISTICS

USE: In armored cars, tanks and other vehicles in the warning and reconnaissance nets of division troops. Its most general use is from ground to air in reconnaissance net.

TYPE OF SIGNAL: CW and voice.

RANGE: (MILES) Moving: CW 25; voice 10.

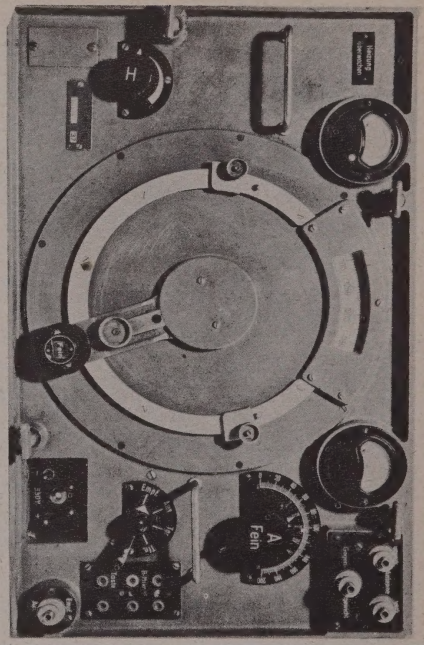
TO COMMUNICATE WITH:

TO REPLACE IN PART:

TRANSPORTATION: Vehicular - usually armored reconnaissance cars.

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
Transmitter	11 3/4"	19"	11"	56 #
Dynamotor U-30a	3 "	6"	11"	16 #

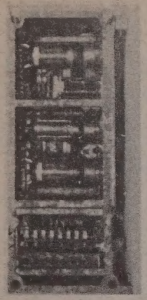
COMBINED WEIGHT OF COMPONENTS:



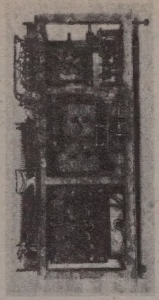
30 W.S./24b-120 (GROUND TRANS.) FRONT VIEW

REMARKS

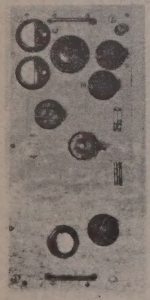
A sturdy well constructed set built probably by Telefunken in 1937. Tubes bear date of July 1934. The old pack receiver Spez 445 b Bs and the later Torn. E. b were used with it. It could be utilized by our troops for deception purposes.



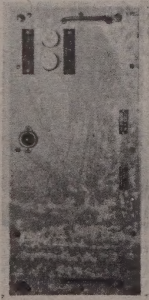
TRANS. - REAR VIEW



POWER SUPPLY - REAR VIEW



TRANS. - FRONT VIEW



POWER SUPPLY - FRONT VIEW

70 W.S. (GROUND TRANS.)

INSTRUCTIONAL LITERATURE:

NOMENCLATURE DESIGNATION: (GROUND TRANS.) 70 W.S.

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 3.0-16.667 IN 3 BANDS AS FOLLOWS: 3.0-5.2; 5.0-9.3; 9.2-16.667

NUMBER OF CRYSTALS:

PRESET FREQUENCIES:

ANTENNA: ROD, MAST OR SINGLE WIRE 25 TO 40 FEET LONG

TUNING: (MO OR CRYSTAL) MO

SENSITIVITY: SELECTIVITY:

POWER SOURCE: DYNAMOTOR U-80A CONNECTED TO 12-VOLT BATTERY.

SIMILAR SETS: SCR-193

POWER OUTPUT: (WATTS) 70

TUBES: (TYPE AND NUMBER) 2 RL 12 P 35 AND 3 RV 12 P 2000.

TACTICAL CHARACTERISTICS

USE: THIS SET IS USED BY ALL RECONNAISSANCE UNITS IN COMMAND NETS AND IN AIR-TO-GROUND CONTROL FROM CORPS.

TYPE OF SIGNAL: CW ONLY.

RANGE: (MILES) 36

TO COMMUNICATE WITH: LOWER ECHELONS IN COMMAND NETS OR WITH AIRCRAFT.

TO REPLACE IN PART:

TRANSPORTATION: VEHICULAR - TANKS AND RECONNAISSANCE CARS.

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
TRANSMITTER CASE	21.25"	11.8"	19.29 "	
POWER UNIT CASE	21.25"	11.8"	16.14"	
TRANSMITTER INCLUDING CARRYING CASE.				78.1 #
POWER UNIT INCLUDING CARRYING CASE.				84.7 #
COMBINED WEIGHT OF COMPONENTS:				

REMARKS

70 W.S. IS A SHORTWAVE TRANSMITTER MANUFACTURED BY LORENZ FOR USE IN ARMORED RECONNAISSANCE UNITS. THE EQUIPMENT CONSISTS OF A TRANSMITTER AND POWER UNIT, EACH SEPARATELY CONTAINED IN A CARRYING CASE. A LIGHT METAL CASTING FORMS THE CHASSIS OF EACH UNIT AND BOTH UNITS ARE INCLOSED IN SHEET METAL COVERS. THE SUBASSEMBLIES ARE EASILY ACCESSIBLE FOR INSPECTION.

THE TRANSMITTER IS IN TWO STAGES; IT IS SIMPLE TO OPERATE; IT IS SPECIALLY SUITED TO MOBILE INSTALLATION. THE EQUIPMENT OPERATES WHILE ON THE MOVE AND WHEN STATIONARY. IT IS PROBABLY USED AT TIMES TO SUPPLEMENT THE HEAVY 1-KW. TRANSMITTER "B" AT ARMY OR CORPS HEADQUARTERS.

80 W.S.a (GROUND TRANS.)

NOMENCLATURE DESIGNATION:

INSTRUCTIONAL LITERATURE: TB Sig E 10

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 1.12-3.0 IN 3 BANDS AS FOLLOWS: 1.11-1.55; 1.53-2.15; 2.13-3.01.
NUMBER OF CRYSTALS: NONE.
PRESET FREQUENCIES: NONE.
ANTENNA: STATIONARY, 8-METER VERTICAL MAST WITH STAR FLAT-TOP; MOBILE, VEHICULAR ROD OR ROOF ANTENNA.
TUNING: (MO OR CRYSTAL) MO. GANGED TUNING OF R-F OSCILLATOR AND R-F AMPLIFIER.
SELECTIVITY:
SENSITIVITY:
POWER SOURCE: DYNAMOTOR U-80A WITH OUTPUT OF 800 VOLTS, 0.3 AMPERES AND 240 WATTS; MOTOR, INPUT 12 VOLTS, 35 AMPERES AND 420 WATTS AND BIASING VOLTAGE OF - 300 VOLTS, .005 AMPERE.
SIMILAR SETS: 30 W.S.A; THESE TWO SETS ARE SIMILAR IN DESIGN AND IDENTICAL IN OPERATION. THE AMERICAN SETS SCR-177, SCR-188, SCR-193, SCR-197 AND SCR-299 COVER THE GREATER PORTION OF THE FREQUENCY RANGE OF THE 80 W.S. A AND HAVE COMPARABLE TRANSMISSION RANGES.
POWER OUTPUT: (WATTS) EITHER 80 OR 10.
TUBES: (TYPE AND NUMBER) 6. THREE RL 12 P35 (35-WATT PENTODES) AND THREE RV 12 P2000 (KNOB TYPE PENTODES). ONE OF THE RL 12 P35 PENTODES IS IN A TUNED GRID OSCILLATOR CIRCUIT WHICH IS CAPACITATIVELY COUPLED TO A PAIR OF THE SAME TYPE TUBES IN PARALLEL AS AN R-F AMPLIFIER. THIS R-F AMPLIFIER HAS A TUNED GRID CIRCUIT. TWO OF THE RV 12 P2000 TUBES ARE USED AS SPEECH AMPLIFIERS AND THE THIRD AS FREQUENCY CHECK OSCILLATOR WHICH CAN BE PUT INTO OPERATION ONLY WHEN THE MAIN SWITCH IS IN TELEPHONY POSITION. THE FILAMENTS OF ALL TUBES ARE CONNECTED IN PARALLEL. THE CATHODES OF THE RV 12 P35 TUBES ARE CONNECTED INTERNALLY TO THE METAL BASES OF THE TUBES.

TACTICAL CHARACTERISTICS

USE: IN TANK DIVISION AND TANK BRIGADE RADIO SETS ESPECIALLY IN LIAISON OPERATIONS WITH RECONNAISSANCE CARS AND TANKS. IT IS REPLACING THE 30 W.S. A IN THE GERMAN ARMY. GERMAN RECEIVERS APPROPRIATE FOR USE WITH THIS TRANSMITTER ARE TYPES TORN. E. 8 AND MW. E. A. IT COULD BE USED BY OUR OWN TROOPS AS A MOBILE UNIT OR AS A FIXED STATION FOR LONG-DISTANCE WORKING.

TYPE OF SIGNAL: CW AND VOICE.

RANGE: AT 10 WATTS, 10 TO 30 MILES (STATIONARY), 5 TO 15 MILES (MOBILE); AT 80 WATTS, 40 TO 100 MILES (STATIONARY), 20 TO 50 MILES (MOBILE). (ESTIMATED FIGURES--LOWER DISTANCE USING CW)

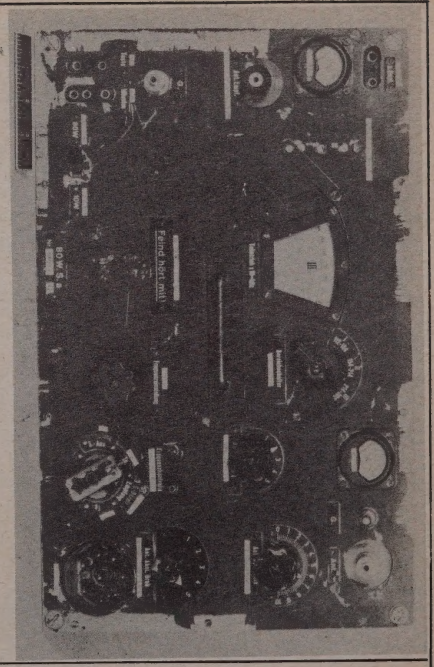
TO COMMUNICATE WITH: 8 W.S. A, 30 W.S., 100 W.S. AMERICAN SCR-197, SCR-299, SCR-177, SCR-188, SCR-193 COVER THE GREATER PORTION OF THE FREQUENCY RANGE OF THE 80 W.S.A AND HAVE COMPARABLE TRANSMISSION RANGES.

TO REPLACE IN PART: 30 W.S. A AND 100 W.S. A

TRANSPORTATION: ARMORED COMMAND CAR OR RECONNAISSANCE CAR.

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
TRANSMITTER 80 W.S. A	18⅛"	11 3/4"	10"	40 #
COMBINED WEIGHT OF COMPONENTS:				

80 W.S.a (GROUND TRANSMITTER) - FRONT VIEW, SHOWING CONTROLS AND METERS.



REMARKS

THE 80 W.S. A IS A VEHICULAR-TYPE, MEDIUM-FREQUENCY, RADIO TRANSMITTER. INTERCONNECTIONS BETWEEN THE TRANSMITTER AND RECEIVER PERMIT THE TRANSMITTING ANTENNA TO BE USED FOR RECEPTION IN THE "OFF" AND "STANDBY" POSITIONS OF THE MAIN SWITCH. BOTH VOICE AND TELEGRAPH TRANSMISSIONS ARE MONITORED BY THE RECEIVER (TORN. E. 8 AND L. W. E. A)

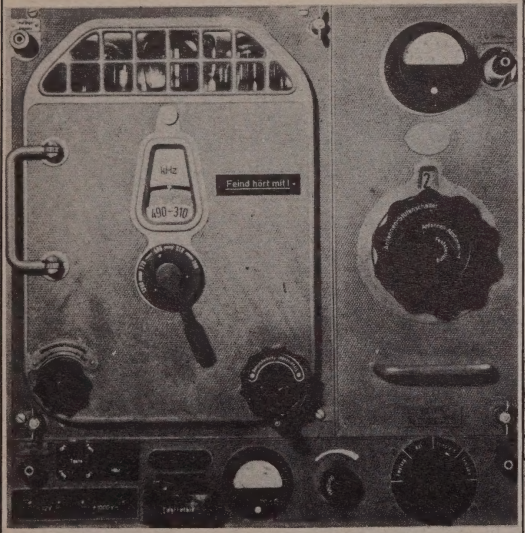
THE TRANSMITTER IS INCLOSED IN A METAL CASING. A BRASS STRIP, APPROXIMATELY 3/4 INCH WIDE AND 9 INCHES LONG, RUNS FROM FRONT TO BACK ON EACH SIDE OF THE TOP OF THE CASING AND INSURES GOOD GROUND CONTACT WITH THE METAL FRAME INTO WHICH THE CASING IS FITTED IN THE VEHICLE.

EIGHT CONTROLS ON THE FRONT PANEL ARE: THE THREE-POSITION BAND SWITCH, THE MAIN TUNING KNOB, THE FIVE-POSITION ANTENNA COUPLING KNOB, THE FIVE-POSITION ANTENNA TUNING KNOB (COARSE TUNING), THE CONTINUOUSLY VARIABLE ANTENNA TUNING KNOB (FINE TUNING), THE FREQUENCY-CHECK SWITCH (THROWN BY RAISING THE LID OVER THE HEADSET JACK WHICH IS USED DURING FREQUENCY CALIBRATION), THE FOUR POSITION MAIN SWITCH, AND THE SWITCH FOR DECREASING THE OUTPUT TO 10 WATTS. THE TELEGRAPH KEY IS INSERTED IN THE TWO-CONTACT JACK AT THE EXTREME LOWER LEFT CORNER OF THE FRONT PANEL AND THE MICROPHONE PLUG IS INSERTED IN THE THREE-CONTACT JACK BESIDE IT. THE FREQUENCY DIAL IS CALIBRATED IN KILOCYCLES AND IS NUMBERED EVERY TWENTY KILOCYCLES. THE DIAL IS ILLUMINATED BY A BLUE PILOT LIGHT WHICH IS REMOVABLE THROUGH A SPRING-HINGED LID IN BACK OF THE DIAL.

FOR TELEGRAPHY OPERATION, THE KEY COMPLETES THE CIRCUIT TO A 12-VOLT RELAY WHICH IN TURN BY-PASSES TO GROUND THE EXCESSIVE GRID-BIAS APPLIED TO THE GRIDS OF THE R-F OSCILLATOR AND THE R-F AMPLIFIER TUBES. IN TELEPHONY OPERATION, THE SUPPRESSOR GRIDS OF THE R-F AMPLIFIER TUBES ARE MODULATED. A PAIR OF RV 12 P2000 TUBES IN PARALLEL ACTS AS A SINGLE-SPEECH AMPLIFIER WITH TRANSFORMER INPUT AND TRANSFORMER OUTPUT.

INSTRUCTIONAL LITERATURE: TB Sig E 9

NOMENCLATURE DESIGNATION: (GROUND TRANS.) 100 W. S.



100 W. S. (GROUND TRANSMITTER)

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mo) 0.2-1.2

NUMBER OF CRYSTALS: None

PRESET FREQUENCIES: None

ANTENNA: One 33-foot mast with 4-spoke umbrella (medium frequency) or one 20-foot sectional mast with 3-spoke umbrella (higher frequency). Roof masts sometimes used.

TUNING: (MO or CRYSTAL) MO, self excited.

SENSITIVITY: SELECTIVITY:

POWER SOURCE: Mobile--dynamotor U-100 or U-100 a consumption 12 volts D-C at 30.8 amperes, output 1000 volts at 240 mA, speed 4000 rpm); Fixed--gasoline driven D-C generator (consumption 12 volts at 7.3 amperes, 1000 volts at 240-300 mA).

SIMILAR SETS: SCR-197

POWER OUTPUT: (WATTS) 100 (can be switched to provide 1/10 the output)

TUBES: (TYPE AND NUMBER) 3. Two RS-237 triodes (M.O. and P.A.) and one RS-241 (speech amplifier); both are directly heated Telefunken tubes requiring 12 volts.

TACTICAL CHARACTERISTICS

USE: Administration control set for large areas. It can be used in vehicle or as a fixed station. Division command set use possible.

TYPE OF SIGNAL: CW and voice; local and remote keying; facsimile transmission.

RANGE: (MILES) CW 25-200; voice 10-70. The lower ranges are "on the mode".

TO COMMUNICATE WITH: Other sets within the same frequency range. Torn. E. b - all-purpose receiver--and Lw. E. a are usually used as receivers. Type 80 W.S.c can be netted with it.

TO REPLACE IN PART:

TRANSPORTATION: Armored command cars or half tracks.

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
Transmitter only	18"	18 1/2"	10"	75 #
Power Supply Unit - U-100 dynamotor	8"	8 "	16"	48 #
COMBINED WEIGHT OF COMPONENTS:				

REMARKS

Transmitter adapted for use in mobile command post. Circuit MOPA. Inductively tuned variometer coils; capacity type wave change system. Built on 3 assemblies - RF, LF and antenna tuning - fitted together by interconnecting lugs and sockets. Compartments of die-cast aluminum. Colors used liberally on dials and switches to indicate different bands.

Set was originally used with Spez. 4458 receiver (obsolescent); now used with receiver Torn. E. b. Manufactured by Lorenz. It may be known also as Type L. S. 100/108 (24v-108) in Lorenz commercial catalog and was developed before the war so that it could be quickly converted.

SEG 2T (GROUND TRANS.)

NOMENCLATURE DESIGNATION:

INSTRUCTIONAL LITERATURE:

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 500-600

NUMBER OF CRYSTALS:

PRESET FREQUENCIES:

ANTENNA: A VOLTAGE-FED, DOUBLE-DIAMOND, CHIREIX-MOSNY ARRAY WITH QUARTER-WAVE SPACE REFLECTOR IS USED TO OBTAIN A FORWARD LOOKING BEAM APPROXIMATELY 40° WIDE WITH PROVISION FOR VERTICAL OR HORIZONTAL POLARIZATION. IT CAN BE FOLDED FOR STOWING.

TUNING: (MO OR CRYSTAL) MO

SENSITIVITY: SELECTIVITY:

POWER SOURCE: ONE 2-VOLT STORAGE BATTERY FOR HEATERS, FILAMENTS, RELAYS AND MICROPHONE; TWO 90-VOLT DRY BATTERIES IN SERIES.

SIMILAR SETS:

POWER OUTPUT: (WATTS) BELIEVED TO BE RATED .04-.06 WATTS. PLATE CURRENT 11 MILLIAMPERES WITH 124 VOLTS RISING TO 13 MILLIAMPERES WHEN MODULATED.

TUBES: (TYPE AND NUMBER) TWO DS 310, TWO RL 2T2 AND ONE RV 2P 800.

TACTICAL CHARACTERISTICS

USE: THIS SET IS INTENDED FOR SHORT-RANGE, QUASI-OPTICAL, POINT-TO-POINT WORKING. COMMUNICATION IS HIGHLY DIRECTIONAL. USED IN E.W. (EARLY WARNING) AIR-RAID SYSTEMS, AND TO PASS SOME TACTICAL TRAFFIC.

TYPE OF SIGNAL: TONE AND VOICE

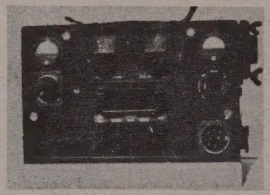
RANGE: (MILES) LIMITED - QUASI- SERIOUSLY AFFECTED BY INTERVENING OBJECTS. IN TESTS, LINE OF SIGHT COMMUNICATION PRODUCED SIGNALS UP TO 8 MI. THE MAXIMUM DISTANCE COVERED BY THE TESTS. AT THIS DISTANCE HORIZONTAL WAS SUPERIOR TO VERTICAL POLARIZATION.

TO COMMUNICATE WITH:

TO REPLACE IN PART:

TRANSPORTATION: VEHICULAR OR PACK (2 MAN)

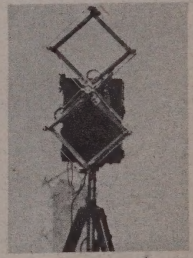
PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
TRANSCEIVER	12 1/4"	9 1/4"	6 1/2"	21 #
BATTERY BOX	12 1/4"	8 "	6 1/2"	27 # (APPROXIMATELY)
ACCESSORIES BOX	24 1/2"	11 "	7 1/2"	32 #
TRIPOD 3' 8½" LONG 8" DIAMETER, WEIGHING 16 #				
COMBINED WEIGHT OF COMPONENTS:				96 #



FRONT VIEW OF TRANSMITTER

SET IN OPERATING POSITION

CHIREIX ANTENNA HORIZONTAL POSITION



CHIREIX ANTENNA VERTICAL POSITION

SEG 2 T (GROUND TRANSMITTER)

REMARKS

SEG 2T IS A UHF TRANSPORTABLE, TRIPOD-MOUNTED, SINGLE-CHANNEL, BEAMED EQUIPMENT WITH PROVISION FOR VOICE AND FOR LOCAL AND REMOTE CONTROL. THE TRANSCEIVER, BATTERIES, AND ACCESSORIES ARE CARRIED IN CASES OF STANDARD GERMAN CONSTRUCTION AND THE TRIPOD IN A CANVAS BAG. THE FOLDING ANTENNA IS PLUGGED INTO A FOUR-POINT SOCKET AT THE BACK OF THE TRANSCEIVER CASE. BATTERIES ARE STOWED IN A 3-COMPARTMENT CASE. ANTENNA, HEADPHONES, MICROPHONE HANDSET KEY, REMOTE CONTROL CABLE, SPARE TUBES AND INDUCED CURRENT AMMETER ARE CARRIED IN AN ACCESSORIES BAG.

AN ACORN TUBE ACTS AS A PLATE-MODULATED, PARALLEL ROD OSCILLATOR. THE DETECTOR IS A CONVENTIONAL, SUPERREGENERATIVE, ACORN OSCILLATOR. THE TWO CIRCUITS ARE IDENTICAL EXCEPT FOR GRID LEAK OF 5 KILOHMS IN THE TRANSMITTER CIRCUIT.

A TRIODE OPERATING AS A HARTLEY OSCILLATOR ON 550 KC/S, COUPLED INDUCTIVELY TO THE DETECTOR, PROVIDES EXTERNAL QUENCH. QUENCH VOLTAGE IS PRESET BY MEANS OF A 200-OHM POTENTIOMETER ACROSS THE COUPLING COIL. SUPERREGENERATION IS CONTROLLED BY A 10-KILOHM VARIABLE RESISTANCE IN THE FEED TO BOTH OSCILLATORS.

IT IS BELIEVED THAT SPECIAL TROOPS USE THIS EQUIPMENT IN AIR-RAID NET OR TACTICAL NET AT CORPS. CAMOUFLAGING THIS TRIPOD-MOUNTED GEAR AND THE NECESSITY FOR AN OPTICAL TRANSMISSION PATH, MAKE IT VULNERABLE TO "SPOTTING".

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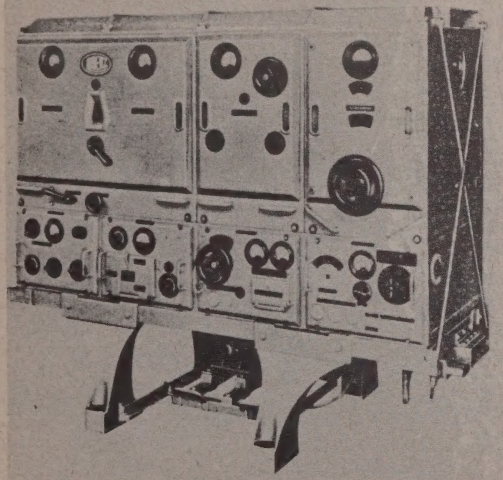


1000 W. S. b (GROUND TRANSMITTER)

INSTRUCTIONAL LITERATURE:

NOMENCLATURE DESIGNATION: (GROUND TRANS.) 1000 W. S. b

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 1.09-6.7

NUMBER OF CRYSTALS: One quartz calibrator for frequency checking.

PRESET FREQUENCIES:

ANTENNA: Two 80-foot masts supporting single wire antennas as follows: 83 feet long for medium and 33 feet long for high frequency.

TUNING: (MO OR CRYSTAL) MO

SENSITIVITY: SELECTIVITY:

POWER SOURCE: Dynamotor U-1000 connected to A-C line or M.G. (gas engine) set.

SIMILAR SETS: 1500 W.S.A, SCR-299 and SCR-399.

POWER OUTPUT: (WATTS) 1000

TUBES: (TYPE AND NUMBER) Two RF-084k, 7 RS 282, 2 RS 329 and 3 RGN 2004.

TACTICAL CHARACTERISTICS

USE: At Army Staff and Corps Staff for signal communication with the chief task force commander. It is used also as ground set for air-ground liaison with Luftwaffe.

TYPE OF SIGNAL: CW, tone, voice; impulse, telephoto, hi-speed telegraphy, teletype.

RANGE: (MILES) CW 700; Tone 700; Voice 150-300.

TOCOMMUNICATE WITH: All-purpose receivers in command net. Torn. E. B and Lw. E. A are generally used.

TO REPLACE IN PART:

TRANSPORTATION: Three heavy motor cars and one 2-wheel trailer.

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
Transmitter	5' 2"	3' 4"	6' 3/4 "	1630 #
Motor Generator	1'11"	1'10"	6'1 "	970 #
Engine Generator Set	2' 6"	2' 6"	6'5 "	147 #
COMBINED WEIGHT OF COMPONENTS:				

REMARKS

This set is manufactured by both Telefunken and Lorenz. It is a commercial design adapted to military use. Provision for both local and remote keying.

Frequency stability is insured by sturdy but exact construction and the use of ceramic materials in frequency controlling components.

Circuit, MOPA: One RS 282 as Master Oscillator; Two RS 282, in parallel as Amplifiers; Two RS 329 in parallel as Output; Two RS 282 and Two RE 084k as Audio; Two RS 282 and Three Rectifiers RGN 2004 for keying.

1500 W. S. a (GROUND TRANS.)

NOMENCLATURE DESIGNATION:

INSTRUCTIONAL LITERATURE:

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 0.1-06

NUMBER OF CRYSTALS: None

PRESET FREQUENCIES: None

ANTENNA: 80-foot mast with 6 or 12 spoke "umbrella".

TUNING: (MO OR CRYSTAL) MO.

SENSITIVITY: SELECTIVITY:

POWER SOURCE: Dynamotor U-1500 connected to A-C lines or M.G. (gas engine) set.

SIMILAR SETS: 1000 W.S.a

POWER OUTPUT: (WATTS) 1500

TUBES: (TYPE AND NUMBER) 14. One RS 282 as master oscillator; two RS 282 in parallel as amplifiers; two RS 329 in parallel as output; two RS 282 and two RE 084k as audio, two RS 282 and three rectifiers RGN 2004 for keying.

TACTICAL CHARACTERISTICS

USE: For communication between Corps, Ground Headquarters, and Army staffs.

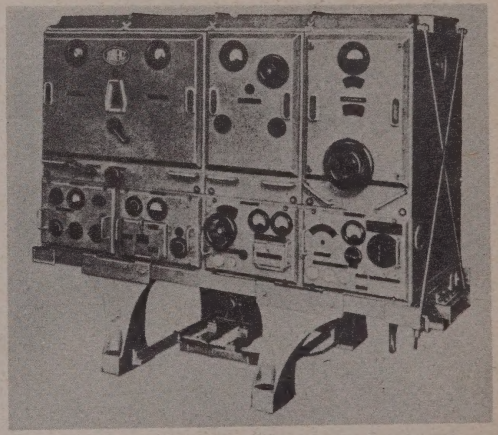
TYPE OF SIGNAL: CW, tone, voice, impulse, telephoto, high-speed telegraphy, teletype.

RANGE: (MILES) CW, 725; Tone, 725; Voice 18-370.

TO COMMUNICATE WITH: Radio sets on the same frequency range. Receivers Lw. E. a and Torn. E. 6 are used with this transmitter.

TO REPLACE IN PART:

TRANSPORTATION: Three heavy motor cars and one two-wheel trailer. The first car carries the transmitter, the second the receiver to be used with it, the third the rigging antenna devices and operating personnel. The trailer carries the power set.



1500 W.S.a (GROUND TRANSMITTER)

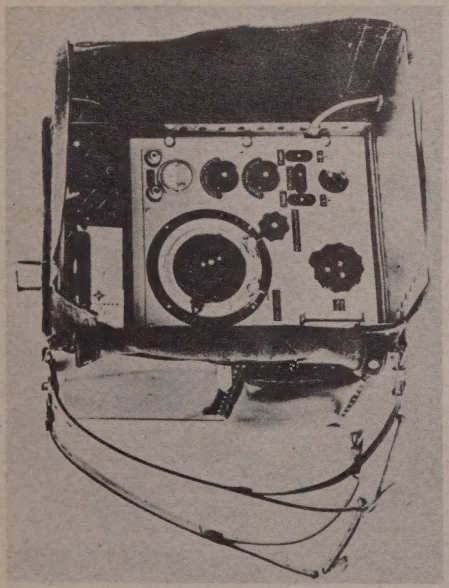
PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
Transmitter	5' 2"	3' 4"	6' 3/4"	430 #
Motor Generator Set	1' 11"	1' 10"	6' 1 "	970 #
Engine Generator Set	2' 6"	2' 6"	6' 5 "	670 #
COMBINED WEIGHT OF COMPONENTS:				

REMARKS

A three-stage transmitter for installation in motor cars and fixed stations. It is divided into several units for quick removal and replacement.

A universal receiver such as the Spez. 976 Bs was used with this transmitter. Later, transition was made to the more modern Lw. E. a.

Provision is made for both local and remote keying. There is connection for facsimile transmission and an automatic keying device.



AKS 25 (GROUND TRANSMITTER)

INSTRUCTIONAL LITERATURE:

NOMENCLATURE DESIGNATION: (GROUND TRANS.) AKS 25

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 3.0-6.0

NUMBER OF CRYSTALS: None

PRESET FREQUENCIES: Two

ANTENNA: 33-foot antenna on one 33-foot mast. Counterpoise four 33-foot wires.

TUNING: (MO OR CRYSTAL) MO

SENSITIVITY: SELECTIVITY:

POWER SOURCE: Engine-driven or pedal-driven generator. 350 volts at 250 mA; 12.5 volts at 2.5 amperes.

SIMILAR SETS: SCR -284 and SCR-694.

POWER OUTPUT: (WATTS) 25 when operated by engine generator; 20 watts when operated by pedal generator.

TUBES: (TYPE AND NUMBER) Five RL 12 T15. MO buffer and push-pull output, grid modulated.

TACTICAL CHARACTERISTICS

USE: In infantry divisions and in artillery regiments for reconnaissance.

TYPE OF SIGNAL: CW tone and voice. Push button allows tone modulation for calling purposes.

RANGE: (MILES) CW 50; Voice 3.

TO COMMUNICATE WITH: A pack receiver similar to the transmitter in size and weight covering 0.1-10.0 in 8 bands such as Torn. E. 8 etc.

TO REPLACE IN PART:

TRANSPORTATION: Man pack or animal pack

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
Transmitter and batteries in wooden pack	17.7"	12"	14½"	60 # (approximately)
COMBINED WEIGHT OF COMPONENTS:				

REMARKS

A Lorenz commercial set of 1938 design. Antenna is automatically switched from receiving to transmitting by a key when telegraphing or by a push button on the microphone through antenna relay when using voice. When operating with tone, the speech amplifier tube is connected as tone generator.

The circuit is in three R-F stages - master oscillator, neutralized buffer amplifier and neutralized push-full amplifier. Modulation in grid of power amplifier tube and keying in grid circuit of all stages.

Feldfu a1, b, c. (GROUND TRANSCEIVER)

NOMENCLATURE DESIGNATION:

INSTRUCTIONAL LITERATURE: TB Sig E 12

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) Feldfu. a1-120-156, (FIXED WAVES NO. 151-178)
Feldfu. B- 90-110, (FIXED WAVES NO. 211-240)
Feldfu. c-130-158, (FIXED WAVES NO. 181-210)
Feldfu. F- 28-33.

NUMBER OF CRYSTALS: None

PRESET FREQUENCIES: Type B, 30 Type A1 and C, "None, but dial is graduated in raised marks, every 5 numbers."

ANTENNA: Rod used for both transmitting and receiving, varying in length from 2 feet in type A1 to 6 feet in type F.

TUNING: (MO OR CRYSTAL) MO.

SENSITIVITY: SELECTIVITY:

POWER SOURCE: Batteries for type A1, 1-2B 19, 1-90 v plate. For types B and C, 2.4 NC 28, WG1 2.4a

SIMILAR SETS: SCR-194, SCR-195 and SCR-300.

POWER OUTPUT: (WATTS) Types A1 and F, .15; types B and C, 1.2.

TUBES: (TYPE AND NUMBER) Type A1: one RV 2.4P 700, one RV 2.4T 1, one RV 2.4P 2. Type B, one RV 2.4P 700 used as R-F amplifier and monitor, one RL 2.4P 2 used as A-F amplifier and modulator, and one RL 2.4T 1 used as superregenerative detector and R-F oscillator.

TACTICAL CHARACTERISTICS

USE: Walkie-talkie used for tactical communication between battalions and companies. It may be operated while stationary or on the move. It is thought that the Feldfu. F is used by armored reconnaissance units.

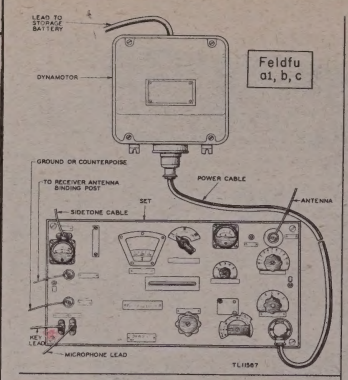
TYPE OF SIGNAL: Voice only.

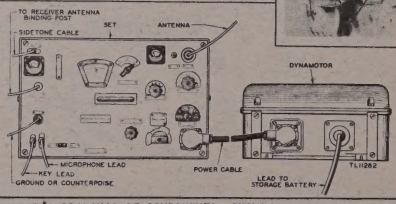
RANGE: (MILES) quoted are .8 for types A1 and F and from .5 to 1 mile for types B and C.

TO COMMUNICATE WITH: It is thought that type F will communicate with Ukw. E. E and 10 W.S. C

TO REPLACE IN PART:

TRANSPORTATION: One man pack, or in vehicular.





ENGINEER'S DRAWINGS OF COMPONENTS, SHOWING INTERCONNECTIONS.

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
Set in case	13 "	4 3/4"	13 7/8"	24 #
Battery	6 15/16"	2 1/8"	4 1/2"	5 #

COMBINED WEIGHT OF COMPONENTS:

FELDFU a1, b, c (GROUND TRANSCEIVER)

REMARKS

Feldfu. A1, B, C, and F are portable, compact, 2-way radiotelephones. They have a common tuning element for transmitting and receiving. Two sets to communicate with each other must be tuned to the same frequency. Obstacles-even men in the line of transmission-seriously effect communication.

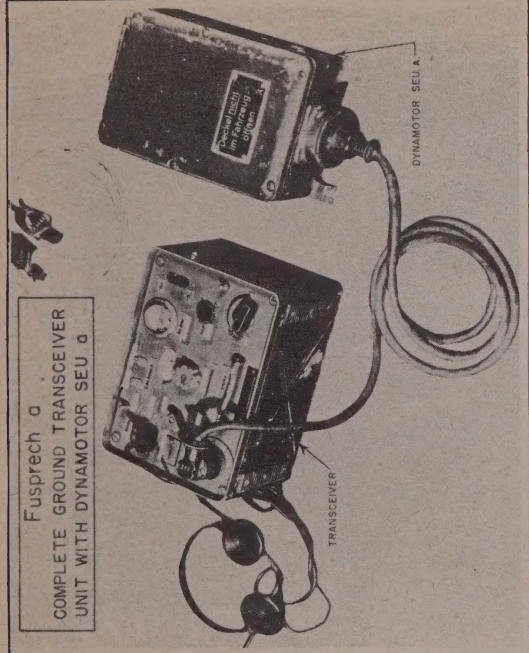
Feldfu. A1 has a sheet-iron container with carrying handle, straps for carrying on the shoulders, and removable bags for accessories. The container holds transmitter-receiver, one hand microphone, one battery (2 B 19) and one 90-volt plate battery. The accessories bag holds one pair of headphones, one throat microphone, two short rod antennas (one a spare) each consisting of two rods approximately 12" long which fit into each other. The antenna bag holds one long rod antenna consisting of 3 rods each approximately 24" long which plug into each other, two guy lines and two tent pins.

Feldfu. B and C have containers with special fittings so that the equipment can be carried on the back. Both types, B and C, are easily identifiable even in the dark, the B type having embossed red marks on top of the container while type C has only one mark (green) in the same place. The container holds the transmitter-receiver, rod antenna (in two sections) 32" long (marked red) for type B and 28" long (marked green) for type C, one battery 2.4 NC 28, one operating attachment, one remote cable (type B), one laryngaphone (type C), and one pack pad.

The Feldfu. B is described as having a removable harness by which it can be carried on the back of the operator. Method of operation is push-to-talk. After communication has been established two-way traffic can be maintained by pressing the microphone switch to transmit and releasing it to receive. A fresh battery will operate the set up to 13 hours at normal temperature.

The frequency range of this set is higher than that of any of our tactical sets. They could be substituted for our SCR-194 and SCR-195. The Feldfunk Sprecher uses a storage battery for primary power, necessitating the use of charging equipment. (Not captured in quantity)

36-7908&BCD-T8



Fusprech a
COMPLETE GROUND TRANSCEIVER
UNIT WITH DYNAMOTOR SEU a

INSTRUCTIONAL LITERATURE:	NOMENCLATURE DESIGNATION:	
TB SIG E7	(GROUND TRANSCEIVER)	Fusprech a

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 24.1 TO 25 THE SAME FOR BOTH TRANSMITTING AND RECEIVING. TUNING DIAL HAS 10 CHANNELS NUMBERED 101 TO 110 EACH REPRESENTING 1 MEGACYCLE.

NUMBER OF CRYSTALS: NONE.

PRESET FREQUENCIES: NONE.

ANTENNA: ROD, 6½ FEET LONG.

TUNING: (MO OR CRYSTAL) MO

SENSITIVITY: EXCELLENT SELECTIVITY: EXCELLENT

POWER SOURCE: DYNAMOTOR UNIT SEUa WHICH OPERATES FROM A 12-VOLT STORAGE BATTERY AT 5.2 AMPERES. POWER REQUIREMENTS: FILAMENTS, 12 VOLTS, 1 AMPERE (APPROXIMATELY); PLATES, 130 VOLTS 25 MILLIAMPERS TO 180 VOLTS 85 MILLIAMPERES (APPROXIMATELY). CURRENT DRAIN FROM 12-VOLT BATTERY IS APPROXIMATELY 5.5 AMPERES.

SIMILAR SETS: SCR-195, SCR-536A AND SCR-610.

POWER OUTPUT: (WATTS) 8

TUBES: (TYPE AND NUMBER) 7 - 6 RV 12 P2000 AND 1 RL 12 P10. IN RECEIVE POSITION, ONE RL 12 P10 IS USED AS A-F OUTPUT AND SIX RV 12 P2000 TUBES ARE USED AS MIXER, H-F OSCILLATOR, 1ST AND 2D I-F AMPLIFIERS, DETECTOR AND 1ST A-F AMPLIFIER; IN TRANSMIT POSITION, ONE OF THE RV 12 P2000 TUBES PERFORMS THE FUNCTION OF MASTER OSCILLATOR AND THE RL 12 P10 THAT OF POWER AMPLIFIER. A SECOND RV 12 P2000 SERVES TO MODULATE THE POWER AMPLIFIER.

TACTICAL CHARACTERISTICS

USE: RADIOTELEPHONE COMMUNICATION BETWEEN RECONNAISSANCE CARS AND BETWEEN RECONNAISSANCE CARS AND TANKS. IT IS USED ONLY FOR VOICE COMMUNICATION. IT CAN BE USED IN NETS WITH AMERICAN AMPLITUDE-MODULATED RADIO SETS WITHIN THE FREQUENCY AND DISTANCE RANGE.

TYPE OF SIGNAL: VOICE ONLY.

RANGE: (MILES) 3½ APPROXIMATELY.

TO COMMUNICATE WITH: FUSPRECH. A AND 10 W.S. H.

TO REPLACE IN PART:

TRANSPORTATION: VEHICULAR - MOUNTED IN RECONNAISSANCE CARS AND TANKS.

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
TRANSCEIVER	7"	11"	7½"	
DYNAMOTOR SEU.A	3"	9"	20 "	
COMBINED WEIGHT OF COMPONENTS:				

REMARKS

A VERY COMPACT, HIGH-FREQUENCY TRANSCEIVER - MOPA TRANSMITTER AND SUPERHETERODYNE RECEIVER. THE SAME ANTENNA, THE SAME FREQUENCY AND CERTAIN TUBES ARE USED FOR BOTH TRANSMITTING AND RECEIVING. A VERY ADVANCED TYPE BELIEVED TO BE A LORENZ PRODUCT. IN FIELD TESTS IT GIVES PRACTICALLY THE SAME RESULTS AS THE SCR-195, BUT THE AMERICAN SET IS SIMPLER AND OF MORE ADVANCED DESIGN.

THE SET IS CONTAINED IN METAL CASE PROVIDED WITH LEATHER CARRYING STRAP. ALL SEVEN TUBES ARE EMPLOYED WHEN THE SET IS OPERATING AS A RECEIVER AND THREE ARE USED WHEN IT IS FUNCTIONING AS A TRANSMITTER. IT IS USED WITH A LOUDSPEAKER AND IS PROVIDED WITH SPECIAL PUSH BUTTON BY MEANS OF WHICH A TONE MODULATION IS TRANSMITTED FOR CALLING PURPOSES.

Fusprech f. (GROUND TRANSCEIVER)

NOMENCLATURE DESIGNATION:

INSTRUCTIONAL LITERATURE:

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 19.9975-21.4725 CALIBRATED ON THE DIAL IN FIXED FREQUENCY NUMBERS 341-400 WITH ADJACENT NUMBERS APPROXIMATELY 25 KC APART.

NUMBER OF CRYSTALS:

PRESET FREQUENCIES:

ANTENNA: ROD ANTENNA 1½ TO 2.2 YARDS LONG USING THE CHASSIS AS A COUNTERPOISE.

TUNING: (MO OR CRYSTAL)

SENSITIVITY: SELECTIVITY:

POWER SOURCE: VEHICLE BATTERY. THE TUBE FILAMENTS OPERATE AT 12 VOLTS AND THE PLATES AT 300 VOLTS. LOW TENSION VOLTAGE OBTAINED FROM VEHICLE BATTERY, PLATE VOLTAGE FROM A CONVERTOR OR VIBRATOR DRIVEN BY THE 12-VOLT VEHICLE BATTERY. VIBRATOR OF THE TYPE WG 12 A OR WG 12B.

SIMILAR SETS: FUSPRECH. A

POWER OUTPUT: (WATTS) APPROXIMATELY 8.

TUBES: (TYPE AND NUMBER) SIX TUBES TYPE RV 12 P 2000 AND ONE RL 12 P 10.

TACTICAL CHARACTERISTICS

USE: SO FAR AS IS KNOWN THIS SET IS USED IN SP GUNS, TYPES 1E F.H. 18/2(SF1.) (WASP) AND S.F.H.18/1 (SF1.) (BUMBLEBEE).

TYPE OF SIGNAL: TONE AND VOICE. ALTHOUGH THE SET WAS DESIGNED PRIMARILY FOR SPEECH TRANSMISSION AND RECEPTION, MCW IS POSSIBLE BY USING THE CALL BUTTON AS A KEY.

RANGE: (MILES)

TO COMMUNICATE WITH:

TO REPLACE IN PART:

TRANSPORTATION: VEHICULAR

NO PHOTOGRAPH OR DRAWING AVAILABLE.

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
OVER-ALL MEASUREMENTS	8"	11"	7"	16 1/2 #

COMBINED WEIGHT OF COMPONENTS:

REMARKS

FUSPRECH. F IS A TWO-WAY TELEPHONY TRANSMITTER-RECEIVER SIMILAR TO FUSPRECH. A IN ALL RESPECTS EXCEPT FREQUENCY. THE RECEIVER IS A SUPERHETERODYNE EMPLOYING A MIXER, A LOCAL OSCILLATOR, TWO I-F STAGES, A DETECTOR AND 2 1-F STAGES. THE AUDIO AMPLIFIER SECTION IS USED TO PROVIDE GAIN AND WHEN PROPER CONNECTIONS ARE MADE (UNKNOWN AT THE PRESENT TIME) IT IS BELIEVED THAT FUSPRECH. F MAY BE USED TO PROVIDE TALKING FACILITIES BETWEEN MEMBERS OF THE SAME VEHICLE AND BETWEEN SEPARATE VEHICLES.

THERE ARE TWO POINTS OF INTEREST IN THIS SET: FIRST, A LOCKING KNOB MARKED "LOS-FEST" ON THE FREQUENCY ADJUSTMENT; SECOND, A SHUTTER ON THE FRONT OF THE CHASSIS THAT ALTERNATELY EXPOSES EITHER THE SOCKET FOR THE LOUDSPEAKER OR THE HEADPHONES, THUS NECESSITATING THE REMOVAL OF ONE BEFORE THE OTHER CAN BE USED.

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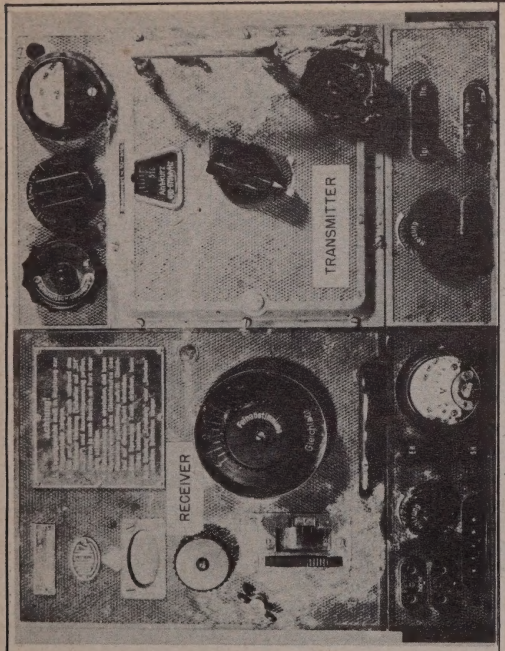


S.E. a 2/24b-202 - GROUND TRANSCEIVER

INSTRUCTIONAL LITERATURE:

NOMENCLATURE DESIGNATION: (GROUND TRANSCEIVER) S.E. a 2/24b-202

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 3-6.67

NUMBER OF CRYSTALS: None.

PRESET FREQUENCIES: None.

ANTENNA: Rod or wire with counterpoise.

TUNING: (MO OR CRYSTAL)

SENSITIVITY: SELECTIVITY:

POWER SOURCE: Two-volt "A" battery (NC-10); two 90-volt "B" batteries.

SIMILAR SETS: Torn. Fu. b1, Torn. Fu. F, SCR-511

POWER OUTPUT: (WATTS) 5

TUBES: (TYPE AND NUMBER) Three RE 084K, 2 RE 134, 1 H 406D or 1 RES 094.

TACTICAL CHARACTERISTICS

USE: Infantry and artillery reconnaissance sets.

TYPE OF SIGNAL: Tone and Voice.

RANGE: (MILES) Tone, 15 (stationary) 5 (moving); voice 5 (stationary), 2 (moving).

TO COMMUNICATE WITH: Torn. Fu. b1 or Torn. Fu. F

TO REPLACE IN PART:

TRANSPORTATION: Two-man pack or vehicle.

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
Transmitter-receiver	14 "	18 "	8 "	35 #
Power pack	12 "	18 "	8 "	30 #
COMBINED WEIGHT OF COMPONENTS:				

REMARKS

Circuit: MOPA. This is an old Lorenz commercial set designed before the war and being used on defensive situations. It is a two-man pack consisting of transmitter, receiver and antenna in one, with accessories, batteries and spares in the other.

Torn. Fu. b1 Torn. Fu. f	(GROUND TRANSCEIVER)	NOMENCLATURE DESIGNATION:	INSTRUCTIONAL LITERATURE: TB SIG E1

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (MO) TRANSMITTER TORN. FU.B1 3-5 (APPROXIMATELY) TRANSMITTER TORN. FU. F 4.5-6.67 (APPROXIMATELY) RECEIVER 3-6.6 (APPROXIMATELY)

NUMBER OF CRYSTALS: CRYSTAL RESONATOR SEALED IN GASEOUS TUBE AND USED FOR CALIBRATION ONLY.

PRESET FREQUENCIES: TWO CLICK STOPS.

ANTENNA: WIRE OR ROD. LOW ROD ANTENNA-VERTICAL PORTION OF 3, AND TOP PORTION OF 8 ANTENNA SECTIONS; HIGH ROD ANTENNA-VERTICAL PORTION OF 7 AND TOP PORTION OF 4 ANTENNA SECTIONS. HIGH ROD GIVES LONGER RANGE. A 45-FOOT WIRE FROM SET TO TREE CAN ALSO BE USED. SET CAN BE OPERATED WITH AMERICAN 15-FOOT VEHICULAR ANTENNA.

TUNING: (MO OR CRYSTAL) MO.

SENSITIVITY: 100 uV INPUT FOR 1 MV OUTPUT.

SELECTIVITY:

POWER SOURCE: BATTERIES. FOR FILAMENT: 2-VOLT STORAGE CELL; FOR PLATE: 125½V. (DRY BATTERIES); FOR GRID: 4½ V. (DRY BATTERY).
SIMILAR SETS: TORN. FU.B2, TORN. FU.C AND SCR-511
POWER OUTPUT: (WATTS) .65 APPROXIMATELY.
TUBES: (TYPE AND NUMBER) TRANSMITTER (MOPA) TWO RV 2P 800 (MASTER OSCILLATOR AND MODULATOR) AND ONE RL 2P 3 (POWER AMPLIFIER). RECEIVER (SUPERHETERODYNE) SIX RV 2P 800. THERE IS ALSO ONE QUARTZ GLOW TUBE (CALIBRATION CRYSTAL) WHICH GLOWS WHEN THE SET IS CORRECTLY CALIBRATED.

TACTICAL CHARACTERISTICS

USE: THESE TWO PORTABLE RADIO SETS, IDENTICAL EXCEPT FOR A DIFFERENCE IN TRANSMITTER FREQUENCY RANGE, ARE INTENDED FOR FIELD SERVICE AS PACK SETS. THEY CAN ALSO BE USED IN NETS WITH AMERICAN AMPLITUDE-MODULATED RADIO SETS WITHIN THE FREQUENCY AND DISTANCE RANGE. TRANSMITTER CAN BE MODULATED OVER AN ORDINARY FIELD TELEPHONE LINE. SATISFACTORY OPERATION IS POSSIBLE OVER ABOUT 1½ MILES OF FIELD WIRE.
TYPE OF SIGNAL: RECEIVED: CW, TONE AND VOICE: EMITTED: CW AND VOICE (AMPLITUDE-MODULATED)

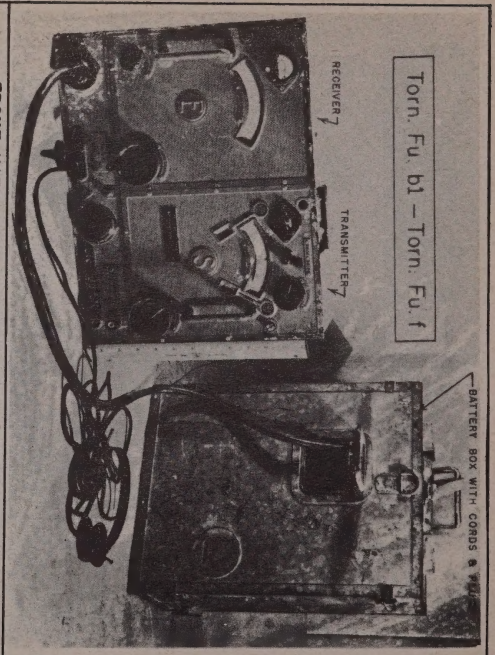
RANGE: (MILES) CW 12, APPROXIMATELY; VOICE 6, APPROXIMATELY.

TO COMMUNICATE WITH: TORN. FU. F, TORN. FU. B, TORN. FU. D2 AND OTHER SETS WITHIN THE SAME FREQUENCY AND DISTANCE RANGE.

TO REPLACE IN PART:

TRANSPORTATION: PACK SETS TO BE CARRIED BY TWO MEN - ONE FOR TRANSMITTER AND RECEIVER AND THE OTHER FOR BATTERY PACK WHICH HOUSES ALSO HEADPHONES, KEY, MICROPHONE, ANTENNA GEAR AND OTHER ACCESSORIES. THE SET ALSO HAS A CASE CONTAINING EQUIPMENT FOR REMOTE VOICE OPERATION. NOT INTENDED TO BE USED WHILE ON THE MOVE.

FRONT VIEW, WITH BATTERY AND ACCESSORY BOX.



PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
POWER SUPPLY PACK	13 1/2"	17"	8"	38 #
TRANSMITTER AND RECEIVER PACK	13 1/2"	17"	8"	35 #
COMBINED WEIGHT OF COMPONENTS:				

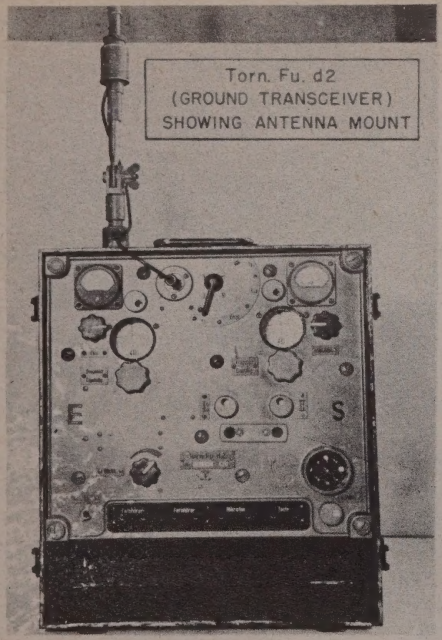
REMARKS

THESE TWO PORTABLE RADIO SETS ARE IDENTICAL EXCEPT FOR A DIFFERENCE IN FREQUENCY TRANSMITTER RANGE. THE SET IS HOUSED IN TWO CASES ONE CONTAINING THE TRANSMITTER AND RECEIVER, THE OTHER CONTAINING THE POWER SUPPLY AND ACCESSORIES.

WHEN GERMAN BATTERIES ARE USED THE PLATE AND GRID USE 130 V. SUPPLY WHICH IS TAPPED AT 4½ V. IF A GERMAN STORAGE CELL IS NOT AVAILABLE, A 2 V. STORAGE CELL OF ANY MANUFACTURE MAY BE USED. IF GERMAN ANODE BATTERIES ARE NOT AVAILABLE, "B" BATTERIES OF AMERICAN MANUFACTURE MAY BE SUBSTITUTED.

THE RECEIVER CIRCUIT CONSISTS OF 1 R.F. AMPLIFIER, 1 H.F. OSCILLATOR, 1 MIXER, 1 I.F. AMPLIFIER, 1 2D DETECTOR AND 1 A.F. AMPLIFIER. INTERMEDIATE FREQUENCY 2000 KC; H.F. OSCILLATOR FREQUENCY 200 KC ABOVE INCOMING SIGNAL. THE CW OSCILLATOR IS A REGENERATIVE 2D DETECTOR. THE SAME TUBE SERVES AS I.F. AMPLIFIER OF THE RECEIVER AND MODULATOR OF THE TRANSMITTER.

THE USE OF TOP-LOADED ANTENNA ACCOUNTS PARTLY FOR GREATER RANGE FOR ONLY SMALL POWER OUTPUT (.65 WATT)



INSTRUCTIONAL LITERATURE: TB SIG E2

NOMENCLATURE DESIGNATION: (GROUND TRANSCEIVER) Torn. Fu. d2

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 33.8-38.0-THE SAME FOR BOTH TRANSMITTING AND RECEIVING. THE DIAL IS CALIBRATED FROM 0 TO 100; FREQUENCY SEPARATION OF APPROXIMATELY 42 KC BETWEEN DIAL DIVISIONS.

NUMBER OF CRYSTALS: A FIXED CRYSTAL OSCILLATOR (7000 KC) CONTROLS THE FREQUENCY CALIBRATOR.

PRESET FREQUENCIES: NONE

ANTENNA: VERTICAL, APPROXIMATELY 6 FEET IN LENGTH. REMOTE ANTENNA CARRIED IN SEPARATE WATERPROOF BAG AFFORDS OPERATION WITH A DISTANCE OF 12 FEET BETWEEN SET AND ANTENNA. THIS MAY BE DESIRABLE WHEN OPERATING FROM A TENT OR DUGOUT.

TUNING: (MO OR CRYSTAL) MO.

SENSITIVITY: SELECTIVITY:

POWER SOURCE: BATTERIES. FOR FILAMENT, 2-VOLT STORAGE CELL; FOR PLATE, TWO 90-VOLT DRY BATTERIES. GRID BIAS FOR RECEIVER IS-3 VOLTS. TRANSMITTER CURRENT DRAIN WHEN USED IN TWO-WAY COMMUNICATION IS: FILAMENT, APPROXIMATELY 2.2 AMPERES ON CW, APPROXIMATELY 2.0 AMPERES ON VOICE; PLATE, APPROXIMATELY 40 MILLIAMPERES ON CW AND APPROXIMATELY 30 MILLIAMPERES ON VOICE. RECEIVER CURRENT DRAIN IS: FILAMENT, APPROXIMATELY 1.15 AMPERES, PLATE, APPROXIMATELY 25 MILLIAMPERES.

SIMILAR SETS: TORN. FU. F, TORN. FU. B1, SCR-300.

POWER OUTPUT: (WATTS) ONE

TUBES: (TYPE AND NUMBER) IN TRANSMITTER: 3 (CW), 4 (VOICE)-ALL TYPE RV 2P 800-AND ONE POWER AMPLIFIER RL 2T 2. IN RECEIVER 6 TUBES ALL TYPE RV 2P 800. THE MODULATOR TUBE OF THE TRANSMITTER IS USED ALSO AS SIDETONE OSCILLATOR AND RECEIVER A-F AMPLIFIER.

TACTICAL CHARACTERISTICS

USE: INFANTRY PACK SET CALLED "HANS". PARATROOPS ALSO USE IT. IT CAN BE USED IN NETS WITH AMERICAN, AMPLITUDE-MODULATED RADIO SETS WITHIN THE SAME FREQUENCY AND DISTANCE RANGE. IT IS POSSIBLE TO MODULATE THE TRANSMITTER OVER AN ORDINARY FIELD TELEPHONE LINE. SATISFACTORY OPERATION CAN BE OBTAINED WITH 1½ MILES OF FIELD WIRE.

TYPE OF SIGNAL: TRANSMITTED: CW AND VOICE (AMPLITUDE MODULATED); RECEIVED: CW, TONE AND VOICE.

RANGE: (MILES) CW, APPROXIMATELY 10; VOICE APPROXIMATELY 2.

TO COMMUNICATE WITH: "POINT TO POINT WORKING" WITH OTHER FU.D2 SETS.

TO REPLACE IN PART: IT SUPERSEDES FU. D.

TRANSPORTATION: PACK SET IN 2 PACKS-TRANSCEIVER IN APPARATUS CASE AND POWER SUPPLY IN ACCESSORIES CASE WITH SPARE PARTS DISTRIBUTED IN BOTH CASES.

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
BATTERY PACK	12 1/2"	14 1/2"	7 1/2"	38 #
SET PACK	12 1/2"	14 1/2"	7 1/2"	35 #
COMBINED WEIGHT OF COMPONENTS:				75 #

REMARKS

TOEN. FU. D2 IS A SMALL, PORTABLE, HIGH-FREQUENCY, TRANSMITTER-RECEIVER CONSISTING OF A THREE-STAGE TRANSMITTER AND A SIX-TUBE SUPERHETERODYNE RECEIVER.

WHEN GERMAN BATTERIES ARE USED IN THIS SET, BOTH PLATE AND GRID TAKE 130-VOLT SUPPLY TAPPED AT 3 VOLTS. IF A GERMAN STORAGE CELL IS NOT AVAILABLE, A 2-VOLT STORAGE CELL OF ANY MANUFACTURE MAY BE USED. IF GERMAN "B" BATTERIES ARE NOT AVAILABLE, "B" BATTERIES OF AMERICAN MANUFACTURE MAY BE SUBSTITUTED. WHEN AMERICAN "B" BATTERIES ARE USED FOR PLATE SUPPLY, A SEPARATE "C" BATTERY MUST BE CONNECTED FOR GRID SUPPLY.

Torn. Fu. g (GROUND TRANSCEIVER)	NOMENCLATURE DESIGNATION:	INSTRUCTIONAL LITERATURE:

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 2.5-3.5

NUMBER OF CRYSTALS: None

PRESET FREQUENCIES: None

ANTENNA: Sectional rod with umbrella (stationary); whip antenna when on the march.

TUNING: (MO OR CRYSTAL) MO.

SENSITIVITY: SELECTIVITY:

POWER SOURCE: One storage battery of type 2.4 NC 28 and a built-in vibrator unit WG1 2.4a Battery capacity at a temperature above 0 Centigrade is about 15 hours, one-third of the time being on send and two-thirds of the time on receive.

SIMILAR SETS: SCR-194, SCR-195 and SCR-300.

POWER OUTPUT: (WATTS)

TUBES: (TYPE AND NUMBER) Transmitter: 2 RL 2.4 P 3; Receiver: 5 RV 2.4 P 700.

TACTICAL CHARACTERISTICS

USE: It is used by the battalion to company, company to platoon and lower echelons. It can be used in a stationary position or on the move.

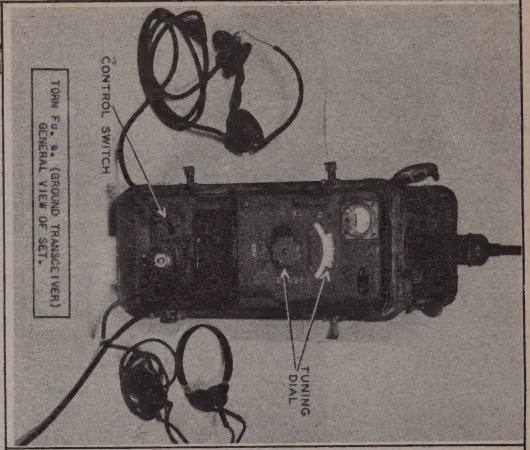
TYPE OF SIGNAL: CW and voice. Two-way communication on both CW and voice are possible both in stationary position and when on the move. With W/T it is possible to work "break in" operation.

RANGE: (MILES) 15 (WT); 7½ (RT)

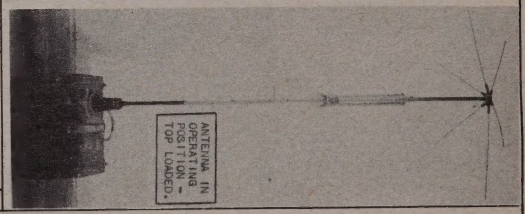
TO COMMUNICATE WITH: Any other set of comparable frequency range.

TO REPLACE IN PART: Pack Set Torn. Fu.F, and Feldfu. B and C.

TRANSPORTATION: Pack set-entire equipment contained in one pack.



TORN FU. g. (GROUND TRANSCEIVER) GENERAL VIEW OF SET.


ANTENNA IN OPERATING POSITION - TOP LOADED.

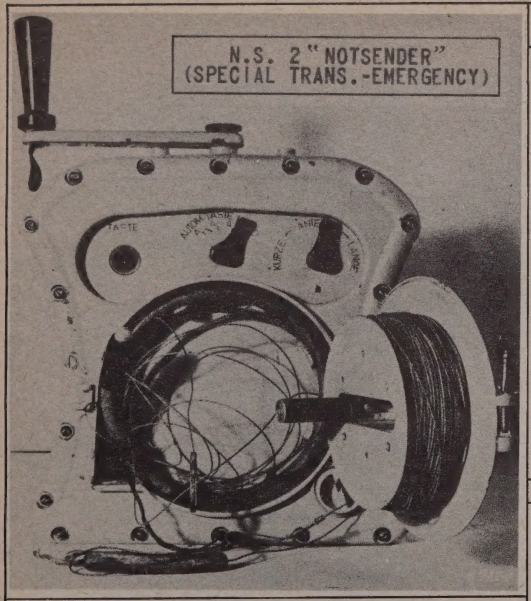
PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
Over-all weight of set				39 # 2 oz.
COMBINED WEIGHT OF COMPONENTS:				

REMARKS

Torn. Fu. g is carried (dismounted) in a steel pack container with small bag and carrying straps. The container has one carrying handle and three connectors for fastening on the carrying straps, two ring eyes on top and a strap with a clip for fastening the small bag. The whip antenna can be stowed on the outer large side under spring clips. The antenna socket is on top.

The container has on the operating side the sender-receiver with clipped-on remote-control unit; on the accessories side are the battery, antenna base, four antenna rods, one antenna tuning coil, one pair of headphones and one key. The small bag carries throat microphone, remote-control cable, counterpoise and one pair of headphones.

The transmitter and receiver have common tuning circuits; adjustment of frequency applies automatically to both so that communication must be on the same frequency. Tuning the antenna for sending automatically, tunes it for receiving, but if sending is forbidden for security reasons it is still possible to tune the antenna to receive.



FRONT VIEW, SHOWING CONTROLS, CRANK, ANTENNA AND GROUND LEAD.

INSTRUCTIONAL LITERATURE:

NOMENCLATURE DESIGNATION: (SPECIAL TRANS. — EMERGENCY) N.S. 2 "NOTSENDER"

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 0.5

NUMBER OF CRYSTALS: One

PRESET FREQUENCIES: One, the INTERNATIONAL DISTRESS FREQUENCY 500 KC.

ANTENNA: Steel antenna wire 235 feet long with ground wire and sinker, raised by box kite or hydrogen-filled balloon.

TUNING: (MO OR CRYSTAL) Crystal

SENSITIVITY: SELECTIVITY:

POWER SOURCE: Hand generator turned at 120 RPM.

SIMILAR SETS: NS 2A, NS 3 and NS 4, SCR-578.

POWER OUTPUT: (WATTS) Approximately 8 watts on CW and 6 watts on tone.

TUBES: (TYPE AND NUMBER) One AL 5N and one RE 13A.

TACTICAL CHARACTERISTICS

USE: Emergency transmitter for dinghy use.

TYPE OF SIGNAL: CW or tone, keyed by hand or automatic device to give SOS and long dash.

RANGE: (MILES) 250 over sea, 120 over land.

TO COMMUNICATE WITH: Nearest shore, ship or aircraft to effect speedy rescue.

TO REPLACE IN PART: NS 1

TRANSPORTATION: Airborne - carried loose for emergency use.

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
Transmitter NS 2	11"	10"	7 1/2"	15 #
Accessories case containing 1 kite, 2 balloons and filling tubes, 2 hydrogen generators and 1 booklet.	2½"	8"	5"	12 #
COMBINED WEIGHT OF COMPONENTS:				27 #

REMARKS

This is the present standard German dinghy transmitter. It has also been copied and manufactured by the Allies. The front of the transmitter unit is used as a chassis for mounting the radio components and the hand-driven generator is fixed to the base. A separate container carries a kite and balloon for use under varying wind conditions. The transmitter is watertight, buoyant and moisture-proof. It is suitable for operation by single person.

The antenna condenser is tuned to give maximum brilliance to the neon indicator; it must be continually adjusted in windy weather because of varing height of kite or balloon supporting the antenna. If wind exceeds 13 miles per hour, the kite is erected, carrying the antenna wire up with it while the ground wire and sinker are lowered over the side. In the absence of wind, the balloon is used to raise the antenna. The balloon is inflated by immersing one of the packaged hydrogen pills in water, an insulated grip protecting against the heat thus generated. 1000-cycle grid modulation is available by switching on filament of modulator tube. The hand-cranked generator develops 4 volts 1.7 amperes on modulated signal, or 4 volts 1.55 amperes on CW and 325 volts at 75 or 65 milliamperes respectively.

This equipment is seen less often than formerly. It is believed that large rubber dinghies are in many cases replacing the one-man type.

N.S.4 "NOTSENDER" (SPECIAL TRANS. — EMERGENCY)

NOMENCLATURE DESIGNATION:

INSTRUCTIONAL LITERATURE:

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (MC) 53.5;61.0

NUMBER OF CRYSTALS: NONE.

PRESET FREQUENCIES: TWO

ANTENNA: STRIP OF COPPER-PLATE STEEL TAPE 3'5" LONG AND 1" IN DIAMETER TAPERING TO 3/16" AT END. IT IS WOUND AROUND THE BOX AND HELD IN POSITION BY 2 CLIPS WHEN NOT IN USE. UNWINDING THE TAPE AUTOMATICALLY TURNS ON THE TRANSMITTER.

TUNING: (MO OR CRYSTAL) MO.

SENSITIVITY: SELECTIVITY:

POWER SOURCE: 11 MIDGET STORAGE CELLS - 3 USED IN PARALLEL FOR 2-VOLT FILAMENT SUPPLY, 8 USED IN SERIES PARALLEL FOR 8-VOLT VIBRATOR SUPPLIES. WEIGHT OF THE BATTERIES - ONE POUND - IS ABOUT 1/3 OF THE TOTAL WEIGHT OF THE EQUIPMENT.

SIMILAR SETS: NS - 2 NOTSENDER.

POWER OUTPUT: (WATTS) 1 TO 2

TUBES: (TYPE AND NUMBER) 2 - LS 1 AND LS 2.

TACTICAL CHARACTERISTICS

USE: SHORT RANGE, SEA RESCUE TRANSMITTER.

TYPE OF SIGNAL: MODIFIED CONTINUOUS WAVE NOTE OF APPROXIMATELY 400 CPS. A PRESS SWITCH "K" IS PROBABLY USED TO KEY THE TRANSMITTER FOR SENDING MORSE.

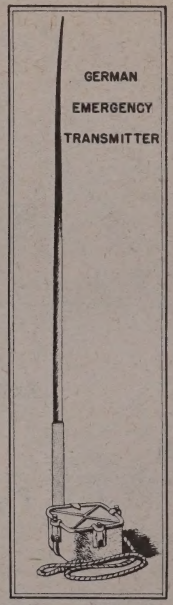
RANGE: (MILES) OPERATIONAL RADIUS TO AIRCRAFT AT 200 FEET IS 9; AT 1000 FEET, 14; AT 4000 FEET, 40.

TO COMMUNICATE WITH:

TO REPLACE IN PART: NS - 2 WHICH USES MORE CRITICAL MATERIALS AND IS USED FOR LONGER RANGES.

TRANSPORTATION: CARRIED LOOSE IN AIRCRAFT FOR EMERGENCY USE IN SEA. IT CAN BE SECURED TO A PERSON OR A SMALL BOAT.

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
ANTENNA	3' 5"	1" (IN DIAMETER)		
MIDGET BATTERIES (11 IN ALL) EACH	1 1/4"	1 3/4"	1/2"	1# 1/2 oz.
OVERALL DIMENSIONS OF NOTSENDER	6 1/4"	6 1/4"	3"	3 1/2 #
COMBINED WEIGHT OF COMPONENTS:				



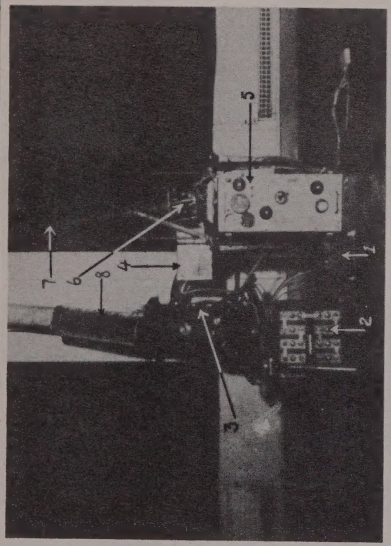
N.S. 4 "NOTSENDER" (ANTENNA EXTENDED)

REMARKS

THE NS-4 IS A SELF-CONTAINED, BATTERY-OPERATED, SEA RESCUE TRANSMITTER. THE APPARATUS IS BRIGHT YELLOW; IT IS WELL DESIGNED, COMPACT, LIGHTWEIGHT, BUOYANT AND WATERTIGHT. IT IS OF SHEET ALUMINUM SPOT-WELDED TOGETHER AND HOUSED IN AN ALUMINUM BOX. COILS AND CONDENSERS (EXCEPT THE PAPER SMOOTHING CONDENSERS IN THE VIBRATOR PACK) ARE OF CERAMIC MATERIAL.

THE VIBRATOR IS NONSYNCHRONOUS, OPERATING ON A FREQUENCY OF APPROXIMATELY 10 CPS. THE ARMATURE IS A LIGHT FLAT STRIP AT RIGHT ANGLES TO THE REED. THE MAGNETIC CIRCUIT IS SMALLER AND THE DRIVING COIL LARGER THAN IN THE CONVENTIONAL VIBRATOR. NO RECTIFIER IS USED, RAW A-C BEING APPLIED TO THE TRANSMITTER SO THAT THE CARRIER WILL BE MODULATED AT THE FREQUENCY OF THE VIBRATOR AND ITS HARMONICS.

THE BATTERIES ARE OF THE TYPE ORIGINALLY DEVELOPED FOR METEOROLOGICAL BALLOON TRANSMITTERS. IN TESTS, THE 2-VOLT LEAD ACID BATTERIES USED FOR POWER SUPPLY DROPPED TO 1.7 VOLTS IN 2 HOURS AND 40 MINUTES; THE 8-VOLT BATTERIES DROPPED TO 6 VOLTS IN THE SAME TIME. THE ESTIMATED LIFE OF THE BATTERIES ON INTERMITTENT USE - 3 MINUTES ON AND 1 OFF - IS 4 HOURS.



(1) RELEASE HOOK
(2) ACCUMULATORS
(3) TIME-PIECE WITH ELECTRICAL SWITCH UNIT
(4) TWELVE 100-VOLT HIGH TENSION BATTERIES
(5) STANDARD LORENZ TRANSMITTER, S. 18205/1
(6) METEOROLOGICAL INSTRUMENTS AND KEYING DEVICE
(7) THE MAST
(8) THERMOMETER UNIT CLAMPED TO THE MAST (ABOUT 10 FT. FROM TOP OF BUOY.)

METEOROLOGICAL SET (SPECIAL TRANS.)

INSTRUCTIONAL LITERATURE:

NOMENCLATURE DESIGNATION: (SPECIAL TRANS) METEOROLOGICAL SET

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mo) 16.44; 8.97; 5.265

NUMBER OF CRYSTALS: One.

PRESET FREQUENCIES:

ANTENNA: Tapered mast 25' long and 4" in diameter at base, in 6 sections strongly fastened together and kept straight by brass spring clips.

TUNING: (MO OR CRYSTAL) Crystal-controlled MOPA.

SENSITIVITY: SELECTIVITY:

POWER SOURCE: Ten alkaline storage batteries connected in series in waterproof container-capacity 30-40 ampere hours; 22 100-volt "B" batteries of standard, heavy-duty, commercial type, paralleled in pairs.

SIMILAR SETS: A smaller meteorological unit has been found.

POWER OUTPUT: (WATTS) 70

TUBES: (TYPE AND NUMBER) 3 RL 12 P 35

TACTICAL CHARACTERISTICS

USE: This transmitter is used as a meteorological indicator. It is believed that if dropped from an airplane it could be used to point out convoys to submarines using HF, D/F equipment.

TYPE OF SIGNAL: CW only.

RANGE: (MILES)

TO COMMUNICATE WITH:

TO REPLACE IN PART:

TRANSPORTATION: Airborne - to be dropped from plane by parachute.

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
Buoy,	29' (Long)	20" (Diameter)		
Mast (Tapered)	25' (Long)	4" (Diameter, at base)		
COMBINED WEIGHT OF COMPONENTS:				

REMARKS

The buoy, 29' long and 20" in diameter, consists of two welded compartments, the lower one open to the water to act as a sinking weight and the upper containing transmitter (Lorenz type S 18205/1, batteries, and timing unit with electrical switch unit. The meteorological unit with keying device is mounted on top of this compartment within a bakelized cloth cylinder which serves also to insulate the antenna mast. Also bolted to the top of the mast is a hygrostatic device which operates a release hook on the base of the buoy and appears to exclude water when submerged and to admit air when floating. A thermometer unit is clamped to the mast about 10' from the top of the buoy.

The timing mechanism, in an iron shell, is actuated by a large spring believed to last a month on a single winding. Time is registered on two concentric dials, the larger of which indicates minutes. The timing unit appearing to operate 4 times in 24 hours for 9-minute periods.

In the same case with the timing unit is a small motor generator which drives a camshaft through a large reduction gear to operate three spring switches believed to apply meteorological keying control to the transmitter. The meteorological unit has four contractors-two from barometric capsules, one from a bimetallic strip (temperature in the buoy), and one externally controlled by a capillary tube from the thermometer unit is made up of 40 aluminum cones clamped together to form a screen surrounding a thermometer, the reading of which is transmitted via a twin capillary tube to the transmitter. It is believed that the battery would last about 19 days at 20 ampere/hours capacity or 32 days at 69 ampere/hours. The construction would indicate that the buoy is expendable.

LUFTWAFFE COMMAND SET (SPECIAL TRANS.)

NOMENCLATURE DESIGNATION:

INSTRUCTIONAL LITERATURE:

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 29.95-33.35

NUMBER OF CRYSTALS: 5 USED TO CHECK THE FREQUENCY CALIBRATION OF THE MASTER OSCILLATOR. FOUR OF THE FIVE CRYSTAL UNITS ARE MARKED AS FOLLOWS: 30-15; 30.5-15.25; 31.0-15.5; 31.5-15.75 MC/S. THE LOWER FREQUENCY IS THE FUNDAMENTAL WHILE THE HIGHER, THE SECOND HARMONIC, IS THE ONE USED. THE FIFTH CRYSTAL IS MARKED "15.67 MC --2%--19.15 METERS" AND HAS A RED BORDER.

ANTENNA: A 30-FOOT VERTICAL DIPOLE OF LORENZ DESIGN. IT IS BELIEVED THAT THE ANTENNA IS USED WITH 2 REFLECTORS FOR BEACON PURPOSES.

TUNING: (MO OR CRYSTAL) MO, CRYSTAL CONTROLLED.

SENSITIVITY: SELECTIVITY:

POWER SOURCE: THE TRANSMITTER IS DESIGNED TO OPERATE ON ANY OF THE FOUR FOLLOWING VOLTAGES: 110, 190, 220 AND 380 VOLTS A-C 50 CPS SINGLE PHASE. VOLTAGE SELECTION SWITCH MAKES PROPER CONNECTION TO THE POWER TRANSFORMER FOR EACH OF THE FOUR VOLTAGE INPUTS

SIMILAR SETS:

POWER OUTPUT: (WATTS) 150-200

TUBES: (TYPE AND NUMBER) 9 RS 337; 2 RV 12 P 4000; 3 LD 2; 2 STV 280/80.

TACTICAL CHARACTERISTICS

USE: THIS TRANSMITTER IS USED AS A RADIO BEACON AND FOR CW, MCW AND VOICE COMMUNICATION FROM GROUND TO PLANE.

TYPE OF SIGNAL: CW, TONE AND VOICE.

RANGE: (MILES)

TO COMMUNICATE WITH:

TO REPLACE IN PART:

TRANSPORTATION: FIXED GROUND TRANSMITTER.

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
OVER-ALL	50"	64"	20"	1000 # (APPROXIMATELY)
COMBINED WEIGHT OF COMPONENTS:				

REMARKS

THE TRANSMITTER IS CONTAINED IN A HEAVILY CONSTRUCTED METAL CHASSIS BELIEVED TO BE OF MAGNESIUM ALLOY; IT IS MOUNTED ON FOUR STURDY LEGS 10" HIGH. THE LOWER PORTION IS DIVIDED INTO TWO SECTIONS; THE LEFT CONTAINS THE REMOVABLE POWER SUPPLY AND CONTROL UNIT WHICH ACCOMMODATES THE POWER TRANSFORMERS, RECTIFIERS, VOLTMETERS, ASSOCIATED SWITCHING CONTROLS AND BEACON KEYER; THE RIGHT CONTAINS THE R-F UNIT WHICH INCLUDES THE MASTER OSCILLATOR, DOUBLER, BUFFER AND POWER AMPLIFIER STAGES.

THE MASTER OSCILLATOR IS OF UNUSUAL DESIGN. IT IS INCLOSED UNDER PRESURE IN A HEAVY CERAMIC CHAMBER WITH A PRESSURE GAUGE ON TOP. TWO TRIODE TUBES LD-2, USED IN THE MO, PLUG INTO THE FRONT AND REAR OF THE CHAMBER. THE MO HAS A FREQUENCY RANGE BELIEVED TO BE 15.475-16.675 MC/S. WORKMANSHIP IS EXTREMELY GOOD. MANY INTRICATE MECHANICAL CONTROLS ARE USED. ALL GEARS AND MANY OTHER PARTS SHOW EVIDENCE OF PRECISION MACHINING. GEAR TRAINS ARE ANTI-BACKLASH. MANY LOCK WASHERS ARE USED. BOLTS THAT ARE CIRCLED IN RED INDICATE REMOVABLE COMPONENTS. THE EQUIPMENT IS WELL DESIGNED FOR COMPACT ASSEMBLY. MOST OF THE PARTS ARE CORROSION PROOF. THERE IS A LAVISH USE OF COPPER WIRE AND STRIPS. IT IS PAINTED THE USUAL BLUE-GRAY WITH BLACK CONTROLS.

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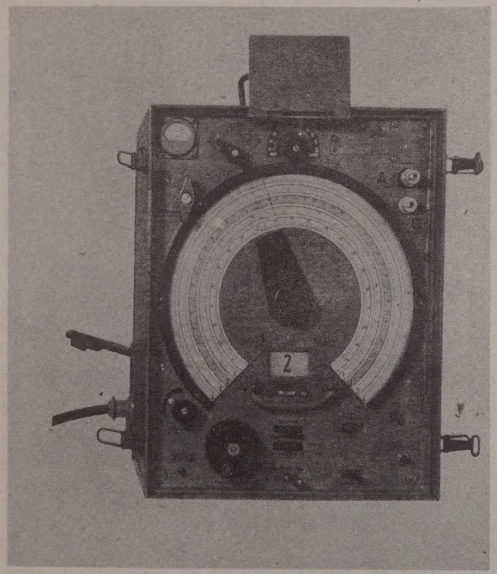


Fu. H.E.c. GROUND RECEIVER

INSTRUCTIONAL LITERATURE:

NOMENCLATURE DESIGNATION: (GROUND RECEIVER) Fu. H. E. c.

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 3.0-25.8 IN 4 BANDS: 3.6-6.0; 5.85-9.7; 9.5-15.7; 15.3-25.8.

NUMBER OF CRYSTALS: ONE - A CRYSTAL OSCILLATOR ON 1870 kc/s (BFO).

PRESET FREQUENCIES:

ANTENNA:

TUNING: (MO OR CRYSTAL)

SENSITIVITY: HIGH

SELECTIVITY: ADEQUATE - BAND WIDTH VARIATION OF 1.2 TO 10 KC/S FOR 6 DB ATTENUATION.

POWER SOURCE. 2-VOLT "A" BATTERY AND 90-VOLT "B" BATTERY HOUSED IN THE TOP OF THE RECEIVER CASE. THE SET MAY BE CONNECTED TO ELIMINATOR NA6. POWER CONSUMPTION WITH PLATE VOLTAGE OF 90 IS ABOUT 12 MILLIAMPERES; FILAMENT CURRENT AT 2 VOLTS IS 1.7 AMPERE.

SIMILAR SETS: Fu. H E.u, BC-342 AND SCR-244

POWER OUTPUT: (WATTS)

TUBES: (TYPE AND NUMBER) 10 RV 2 P 800 (TWO-VOLT FILAMENT PENTODES).

TACTICAL CHARACTERISTICS

USE: FOR ENEMY INTERCEPT SERVICE, FOR SECURITY MONITOR SERVICE AND FOR STANDBY AND INFORMATION SERVICE ON OWN FREQUENCIES. THIS RECEIVER HAS BEEN FOUND HASTILY FITTED INTO A JU 88 WHICH CRASHED IN AUGUST 1940. IT IS ALSO FITTED WITH STRAP HOOKS AND PAD FOR PROTECTION OF PERSON CARRYING IT. IT IS NOT INTENDED TO BE CARRIED FOR LONG DISTANCES SINCE IT WEIGHS 56 POUNDS.

TYPE OF SIGNAL: CW, TONE AND VOICE.

RANGE: (MILES)

TO COMMUNICATE WITH:

TO REPLACE IN PART: Fu. H. E. u

TRANSPORTATION: PACK, PLANE OR VEHICULAR.

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
OVER-ALL WEIGHT 56 #				
COMBINED WEIGHT OF COMPONENTS:				

REMARKS

THIS IS A GENERAL-PURPOSE, PORTABLE, UP-TO-DATE SUPERHETERODYNE RECEIVER OF DIE-CASE LIGHT ALLOY AND SHEET ALUMINUM ELABORATELY DESIGNED. IT OPERATES ON AN I-F OF 1875 KC/S AND CONSISTS OF TWO R-F AMPLIFYING STAGES, FREQUENCY CHANGER, SEPARATE OSCILLATOR, THREE I-F STAGES, AMPLIFYING GRID DETECTOR, OUTPUT TUBE AND HETERODYNE OSCILLATOR. A ROTATING TURRET CARRIES THE R-F AND OSCILLATOR COILS - 4 SETS OF 4 COILS EACH; INDUCTANCE ADJUSTMENT IS BY THREADED IRON CORES IN THE ANTENNA AND R-F PLATE COILS AND BY COPPER SLUG IN OSCILLATOR COILS; PARALLEL TRIMMING IS BY VARIABLE CERAMIC CONDENSERS AND OSCILLATOR PADDING BY FIXED TUBULAR CERAMICS. CIRCUITS ARE TUNED BY A 4-GANG VARIABLE CONDENSER OF DIE-CAST CONSTRUCTION WITH BALL BEARINGS AND CERAMIC INSULATION. HETERODYNE OSCILLATOR IS CONTROLLED BY A THREE-POSITION SWITCH - ONE FOR "OFF" AND THE OTHER TWO GIVING NOTES OF 1000 KC/S BELOW AND 1000 C/S ABOVE THE NULL POINT. A 900 C/S FILTER THAT PERMITS CW SIGNALS TO BE RECEIVED, IN SPITE OF INTERFERENCE, CONSISTS OF A TUNING IRON CORE CHOKE IN THE 2ND DETECTOR PLATE CIRCUIT THAT CAN BE INSERTED BY SWITCH "TONSIEB". AVC IS EXTREMELY EFFECTIVE, RISE OUT OF OUTPUT BEING 2 DB BETWEEN 5 MICROVOLTS AND 50 MILLIVOLTS. THE FIRST I-F COUPLING COMPRISES A PAIR OF TUNED CIRCUITS COUPLED THROUGH A QUARTZ CRYSTAL AND A REACTIVE LINK HAVING COMMON INDUCTANCE AND SMALL CAPACITY. A SMALL 2-GANG VARIABLE CONDENSER DETUNES THE TWO CIRCUITS IN OPPOSITE DIRECTIONS. THE RECEIVER HAS AMPLE TOTAL GAIN; WHEN TESTED ON BAND WIDTH OF 10 KC/S USING AN ARTIFICIAL ANTENNA OF 100 OHMS, THE MODULATED INPUT (30% MODULATED) FOR SIGNAL/NOISE RATIO OF 20 DB VARIED BETWEEN 10 AND 16 MICROVOLTS. THE CORRESPONDING FIGURE ON A NARROW BAND WIDTH AND WITHOUT THE FILTER IS 4 TO 7 MICROVOLTS OR APPROXIMATELY 1 MICROVOLT ON CW.

Fu. H. E. u. (GROUND RECEIVER)

NOMENCLATURE DESIGNATION:

INSTRUCTIONAL LITERATURE:

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 0.5-25.0 IN 5 BANDS.

NUMBER OF CRYSTALS: NONE

PRESET FREQUENCIES: NONE

ANTENNA:

TUNING: (MO OR CRYSTAL)

SENSITIVITY: SELECTIVITY:

POWER SOURCE: TWO-VOLT "A" BATTERY AND 90-VOLT "B" BATTERY HOUSED IN UPPER PART OF RECEIVER CASE.

SIMILAR SETS: Fu. HE. o, TORN. E.B, BC-312, SCR-244, AN/GRR-3(SX-28).

POWER OUTPUT: (WATTS)

TUBES: (TYPE AND NUMBER) 9 RV 2P 800 (PENTODES).

TACTICAL CHARACTERISTICS

USE: FOR INTERCEPT PURPOSES AND TO MONITOR COMMAND NETS. IT COULD BE USED BY OUR OWN TROOPS FOR INTERCEPT PURPOSES.

TYPE OF SIGNAL: CW, TONE AND VOICE.

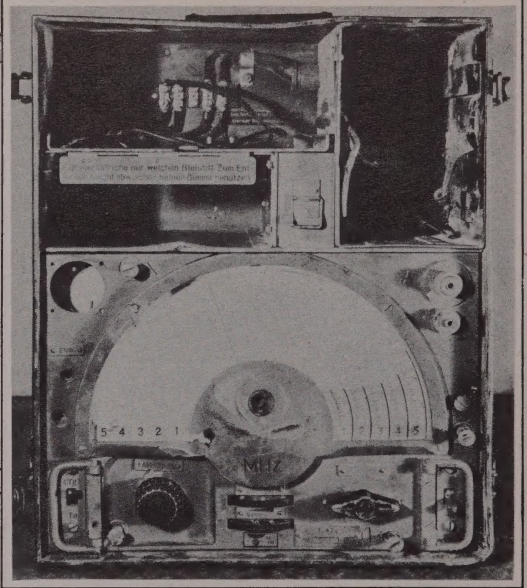
RANGE: (MILES)

TO COMMUNICATE WITH: 5 W.S. AND 30 W.S. A TRANSMITTERS.

TO REPLACE IN PART:

TRANSPORTATION: PACK, PLANE OR VEHICLE.

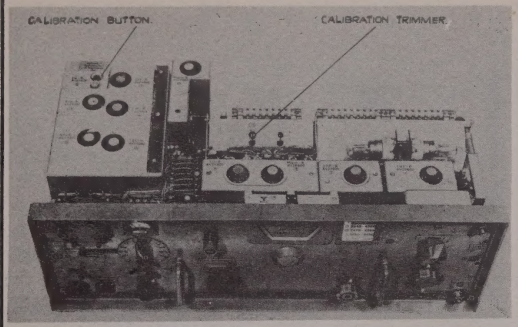
PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
RECEIVER AND BATTERY IN ONE PACK	13 1/2 "	17 "	10 "	56 #
COMBINED WEIGHT OF COMPONENTS:				



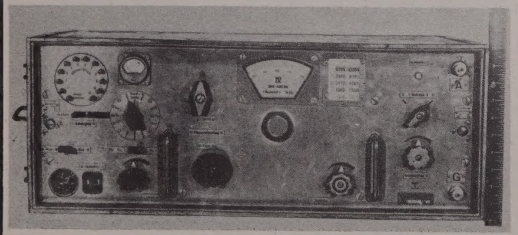
Fu. H. E.u. (GROUND RECEIVER) SHOWING COMPARTMENT FOR A & B BATTERIES.

REMARKS

A WELL CONSTRUCTED, BATTERY-OPERATED 9-TUBE, SUPERHETERODYNE RECEIVER OF CAST "ELEKTRON" ALLOY. A ROTATING TURRET OF INTRICATE DESIGN CARRIES THE R-F AND OSCILLATOR COILS--4 SETS OF 4 COILS EACH SHIELDED BY LIGHTWEIGHT DIE-CAST "CAN". IRON-CORE INDUCTANCES ARE USED IN ANTENNA AND PLATE COILS. VARIABLE CERAMIC CONDENSERS PROVIDE PARALLEL TRIMMING. THE CONTACTS ARE NOT THE BRUSH TYPE; INSTEAD, A LONG CAM FURNISHES PRESSURE TO CONTACT FINGERS.



RECEIVER WITH COVER REMOVED



Kw. E.a (GROUND RECEIVER) FRONT VIEW.

INSTRUCTIONAL LITERATURE:

NOMENCLATURE DESIGNATION: (GROUND RECEIVER) Kw. E.a

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 0.98-10.2 IN 5 BANDS AS FOLLOWS: 0.98-1.61; 1.56-2.55; 2.47-4.06; 3.94-6.395; 6.205-10.2

NUMBER OF CRYSTALS: TWO, USED IN BFO AT APPROXIMATELY 1800 KC SEPARATION. THE ONE USED FOR CALIBRATION WORKS FROM BAND WIDTH 1-7.

PRESET FREQUENCIES: NONE.

ANTENNA: HIGH, LOW, ROOF, GROUND OR AUXILIARY.

TUNING: (MO OR CRYSTAL) CRYSTAL. TUNING IS ACCOMPLISHED BY CONTROL MARKED "ANPASSUNG".

SENSITIVITY:

SELECTIVITY: VARIABLE--RECEIVER CONTROLLED BY "BANDBREITE" WHICH IS GRADUATED FROM 1-8, 1-4 BEING FOR TELEPHONY AND 4-8 FOR TELEGRAPHY.

POWER SOURCE: FILAMENT: 2 VOLT D-C FROM BATTERIES OR RECTIFIER UNIT AT 1.8 AMPERES. PLATE: 90-VOLTS FROM BATTERY CONVERTER UNIT EU-D OR RECTIFIER NA-6 AT 20-25 MA.

SIMILAR SETS: GERMAN LONG-WAVE RECEIVER TYPE (Lw. E.a) BC-342; BC-344.

POWER OUTPUT: (WATTS)

TYBES: (TYPE AND NUMBER) 11, ALL RV 2P 800, EMPLOYED IN THE FOLLOWING STAGES: 2 R-F AMPLIFIERS, ONE LOCAL OSCILLATOR, ONE MIXER, 3 I-F AMPLIFIERS, ONE HETERODYNE, ONE DETECTOR, ONE 1-F AND ONE AVC.

TACTICAL CHARACTERISTICS

USE: FOR STATIONARY AND SEMIMOBILE HEAVY ARMY AND AIR FORCE STATIONS AND FOR STATIONARY NAVAL STATIONS.

TYPE OF SIGNAL: CW, TONE AND VOICE.

RANGE: (MILES)

TO COMMUNICATE WITH: HEAVY TRANSMITTERS -- 120 W.S. AND 70 W.S.

TO REPLACE IN PART:

TRANSPORTATION: FIXED AND SEMIMOBILE (IN VEHICLE).

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
RECEIVER TYPE Kw. E. A (OVER-ALL WEIGHT ABOUT 84 #).	12"	40"	16"	84 #
COMBINED WEIGHT OF COMPONENTS:				

REMARKS

THE TYPE Kw. E. A IS A HIGH-GRADE SUPERHETERODYNE RECEIVER, WIDELY USED WITH HEAVY TRANSMITTERS, EMPLOYING THE FOLLOWING CONTROLS: ON-OFF SWITCH, TP-TG SWITCH, BAND SWITCH, VERNIER TUNING CONTROL WITHIN BAND SELECTED, ANTENNA AND GROUND CONNECTIONS, ANTENNA MATCHING ADJUSTMENT, ANTENNA SELECTION SWITCH WITH TWO POSITIONS (ONE, A STRAIGHT CONNECTION TO FIRST I-F STAGE AND SECOND, A COUPLED CIRCUIT TUNED BY "ANKOPPLUNG" TO PROVIDE FURTHER SELECTIVITY IF NEEDED), A SEPARATE SWITCH FOR AVC AND A METER-SWITCHING ARRANGEMENT. THIS SWITCHING ARRANGEMENT CONSISTS OF A ROW OF PUSH BUTTONS THAT SWITCH THE METER FROM ONE CIRCUIT TO ANOTHER AND PERMIT ELEVEN DIFFERENT READINGS TO BE TAKEN FROM THE SAME METER WITHOUT REMOVING THE RECEIVER FROM ITS CHASSIS.

THERE ARE TWO NEON TUBES NEAR THE H-F TUBES TO PROTECT THE TUNING COILS NEAREST THE ANTENNA FROM LARGE VOLTAGES INDUCED BY COMPARATIVELY NEARBY SENDERS. THE SET SHOULD NOT BE WORKED WITHOUT THESE TUBES. THE RECEIVER IS IN A REINFORCED WOOD CONTAINER WITH TWO COLLAPSIBLE HANDLES AND REMOVABLE LID. IT HAS A 5-STRAND CONNECTOR CABLE 49 INCHES LONG FOR POWER SUPPLY CONNECTION.

Lw. E.a (GROUND RECEIVER)

NOMENCLATURE DESIGNATION:

INSTRUCTIONAL LITERATURE:

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 0.072-1.525 IN 5 BANDS AS FOLLOWS: 0.072-0.128; 0.122-0.241; 0.23-0.43; 0.41-0.8; 0.76-1.525.

NUMBER OF CRYSTALS: TWO CRYSTALS ARE USED IN BFO AT APPROXIMATELY 1800 KC SEPARATION. THE ONE USED FOR CALIBRATION PURPOSES WORKS FROM BAND WIDTH 1 TO 7.

PRESET FREQUENCIES: NONE.

ANTENNA: HIGH, LOW, ROOF, GROUND OR AUXILIARY, THE TYPE DEPENDING UPON THE TRANSMITTER WITH WHICH IT IS WORKING.

TUNING: (MO OR CRYSTAL) CRYSTAL

SENSITIVITY: SELECTIVITY:

POWER SOURCE: 12-VOLT STORAGE BATTERY WITH RECTIFIER UNIT (E)D; POWER SUPPLY UNIT (FU)2/100; BATTERY CONTAINER WITH 2 PARALLEL STORAGE BATTERIES 2B38 AND TWO 90-VOLT BATTERIES (DIN VDE 1210), ONE CARRIED AS A SPARE. CURRENT CONSUMPTION IS APPROXIMATELY 1.6 AMPERES AT 2 VOLTS AND 15-20 MILLIAMPERES AT 90 VOLTS.

SIMILAR SETS: SHORT-WAVE RECEIVER TYPE (KW. E. A); SCR-243 (BC-344) AND SCR-614 (BC-969)

POWER OUTPUT: (WATTS)

TUBES: (TYPE AND NUMBER) 8, ALL RV 2 P 800, EMPLOYED IN THE FOLLOWING STAGES: ONE R-F AMPLIFIER, ONE LOCAL OSCILLATOR, ONE MIXER, TWO I-F AMPLIFIERS, ONE HETERODYNE, ONE DETECTOR AND ONE 1-F STAGE.

TACTICAL CHARACTERISTICS

USE: FOR STATIONARY AND SEMIMOBILE HEAVY ARMY AND AIR FORCE STATIONS AND FOR STATIONARY NAVAL STATIONS.

TYPE OF SIGNAL: CW, TONE AND VOICE.

RANGE: (MILES)

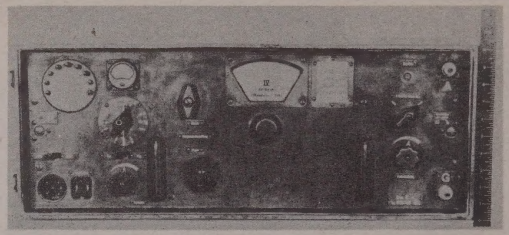
TO COMMUNICATE WITH: HEAVY TRANSMITTER 1500 W.S.A.

TO REPLACE IN PART:

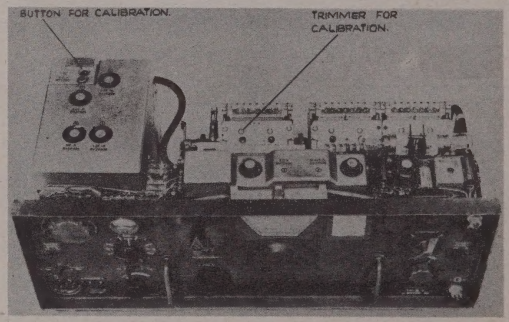
TRANSPORTATION: FIXED AND SEMIMOBILE (IN VEHICLE).

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
OVER-ALL DIMENSIONS	11"	28"	14"	84#

COMBINED WEIGHT OF COMPONENTS:



Lw. E.a (GROUND RECEIVER) FRONT VIEW



RECEIVER WITH COVER REMOVED

REMARKS

THE TYPE LW. E. A IS BUILT INTO A WOODEN CONTAINER WITH TWO FOLDING SIDE HANDLES AND REMOVABLE LID. IT IS A HIGH-GRADE, SUPERHETERODYNE RECEIVER WIDELY USED WITH HEAVY TRANSMITTERS AND EMPLOYING THE FOLLOWING CONTROLS: ON -OFF SWITCH, TP-TG SWITCH, BAND SWITCH, VERNIER TUNING CONTROL WITHIN THE BAND SELECTED, ANTENNA AND GROUND CONNECTIONS, ANTENNA MATCHING ADJUSTMENT, ANTENNA SELECTION SWITCH WITH TWO POSITIONS (ONE, A STRAIGHT CONNECTION TO FIRST I-F STAGE AND THE SECOND, A COUPLED CIRCUIT TUNED BY "ANKOPPLUNG" TO PROVIDE FURTHER SELECTIVITY IF NEEDED) AND A METER SWITCHING ARRANGEMENT. THIS IS IN THE FORM OF A ROW OF PUSH BUTTONS THAT SWITCH THE METER FROM ONE CIRCUIT TO ANOTHER WITHOUT REMOVING THE RECEIVER FROM ITS CHASSIS. THERE IS NO AVC.

TWO NEON TUBES NEAR THE H-F TUBES PROTECT THE TUNING COILD NEAREST THE ANTENNA FROM LARGE VOLTAGES INDUCED BY COMPARATIVELY NEARBY SENDERS. THE SET SHOULD NOT BE USED WITHOUT THEM.

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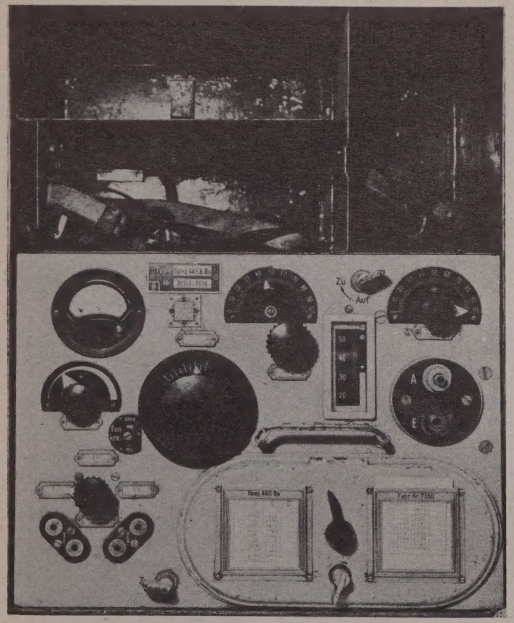


Spez. 445b Bs (GROUND RECEIVER)

INSTRUCTIONAL LITERATURE:	NOMENCLATURE DESIGNATION:	(GROUND RECEIVER)	Spez. 445b Bs
TB SIG E4			

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: 0.1-7.74 APPROXIMATELY. THREE PLUG-IN COIL UNITS WITH FREQUENCY COVERAGES AS FOLLOWS: KURZ (SHORT) 2.66-7.74; MITTEL (MEDIUM) 0.5-3.16; LANG (LONG) 0.1-1.0.

NUMBER OF CRYSTALS: NONE

PRESET FREQUENCIES: NONE

ANTENNA: LONG WIRE OR ROD.

TUNING: (MO OR CRYSTAL)

SENSITIVITY: LOW SELECTIVITY: POOR

POWER SOURCE: BATTERIES. FOR FILAMENT, 4-VOLT ALKALINE STORAGE BATTERY (4.8 NC10) AT 0.25 AMPERES; FOR PLATE, 90-VOLT DRY BATTERY (DIN/VDE 1600) AT 10 MILLIAMPERE ; FOR GRID 3 VOLTS (DRY BATTERY).

SIMILAR SETS: TORN. E. B AND SCR-243.

POWER OUTPUT: (WATTS)

TUBES: (TYPE AND NUMBER) FOUR RE 074 USED AS R-F AMPLIFIER, DETECTOR, 1ST AND 2D A-F AMPLIFIERS

TACTICAL CHARACTERISTICS

USE: WITH THE 5-WATT TRANSMITTER (SW.S./24B 104) AND THE 100-WATT TRANSMITTER (LS 100/108) IT CAN BE USED ALSO IN NETS WITH AMERICAN AMPLITUDE-MODULATED RADIO SETS WITHIN THE SAME FREQUENCY AND DISTANCE RANGE. THE SET SHOULD BE USED FOR THE RECEPTION OF STRONG SIGNALS ONLY.

TYPE OF SIGNAL: CW, TONE AND VOICE.

RANGE: (MILES)

TO COMMUNICATE WITH:

TO REPLACE IN PART:

TRANSPORTATION: PACK CARRIED BY TWO MEN.

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
RECEIVER AND POWER SUPPLY IN PACK	18 "	14 "	8 "	48 #
COMBINED WEIGHT OF COMPONENTS:				

REMARKS

SPEZ. 445 B BS, A TELEFUNKEN PRODUCT, IS A FOUR-TUBE, A-M, TUNED, R-F RECEIVER EMPLOYING A REGENERATIVE DETECTOR CIRCUIT. THE SET, ACCESSORIES AND BATTERIES ARE ALL CONTAINED IN ONE APPARATUS CASE. SINCE THE ELECTRICAL AND MECHANICAL DESIGN IS NOT OF RECENT DATE, THE SET IS BELIEVED TO BE OBSOLETE, BEING SUPERSEDED BY TORN. E. B.

WHEN GERMAN BATTERIES ARE USED, THE PLATE AND GRID TAKE A 90-VOLT ANODE BATTERY ("B" BATTERY) TAPPED AT 3 VOLTS. WHEN GERMAN BATTERIES ARE NOT AVAILABLE, BATTERIES OF AMERICAN MANUFACTURE MAY BE SUBSTITUTED. IF AMERICAN "B" BATTERIES ARE USED FOR PLATE SUPPLY, A SEPARATE "C" BATTERY MUST BE CONNECTED FOR GRID BIAS SUPPLY.

Torn. E. b. (GROUND RECEIVER)

NOMENCLATURE DESIGNATION:

INSTRUCTIONAL LITERATURE: TB SIG E3

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 0.097-7.095 (APPROXIMATELY) COVERED IN 8 OVERLAPPING BANDS AS FOLLOWS: 0.0966-0.1778; 0.171-0.3137; 0.304-0.5588; 0.54-0.99; 0.955-1.74; 1.674-3.075; 2.92-4.82; 4.36-7.095.

NUMBER OF CRYSTALS: NONE

PRESET FREQUENCIES:

ANTENNA: WIRE OR VERTICAL ROD. A 45-FOOT LENGTH OF WIRE CAN BE USED WITH ONE END ATTACHED TO TREE. IF A GOOD GROUND IS NOT AVAILABLE, A 45-TO 60-FOOT COUNTERPOISE CABLE CAN BE USED.

TUNING: (MO OR CRYSTAL)

SENSITIVITY: POOR SELECTIVITY: POOR

POWER SOURCE: BATTERY OR VIBRATOR. BATTERY: FILAMENT, 2-VOLT GERMAN TYPE 2B38 STORAGE CELL; PLATE, 90-VOLT GERMAN TYPE DIN/VDE 1600 DRY BATTERY. VIBRATOR (EW O): FILAMENT, 12-VOLT STORAGE BATTERY WITH DROPPING RESISTOR BUILT INTO VIBRATOR PACK; PLATE, 90 VOLTS DELIVERED BY VIBRATOR SUPPLY. CURRENT CONSUMPTION: FILAMENT, APPROXIMATELY 800 MA; PLATE APPROXIMATELY 12 MA.

SIMILAR SETS: BC-344 AND BC-312

POWER OUTPUT: (WATTS)

TUBES: (TYPE AND NUMBER) 4 RV 2P 800--TWO R-F AMPLIFIERS, ONE DETECTOR AND ONE A-F AMPLIFIER.

TACTICAL CHARACTERISTICS

USE: FOR INTERCEPT AND MONITORING WORK. IT COULD BE USED IN RADIO NETS WITH AMERICAN AMPLITUDE-MODULATED SETS PROVIDED GREAT SENSITIVITY AND SELECTIVITY ARE NOT REQUIRED. IF GERMAN ANODE BATTERIES ("B" BATTERIES) ARE NOT AVAILABLE, AMERICAN "B" BATTERIES MAY BE USED. IF A GERMAN STORAGE CELL IS NOT AVAILABLE, A 2-VOLT STORAGE CELL OF ANY MANUFACTURE MAY BE USED.

TYPE OF SIGNAL: CW, TONE AND VOICE.

RANGE: (MILES)

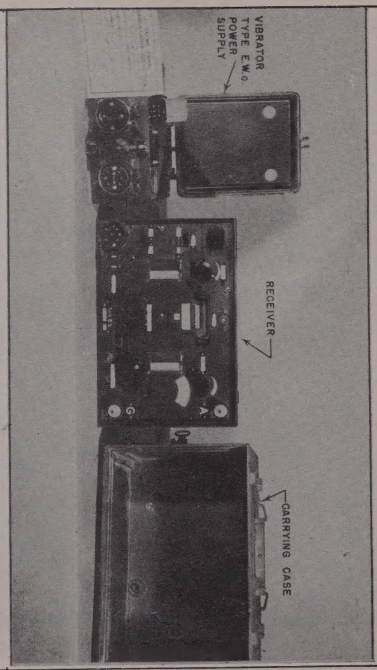
TO COMMUNICATE WITH: TRANSMITTERS 80 W.S. A AND 100 W.S. IT CAN BE USED WITH ALMOST ANY AMPLITUDE-MODULATED SET WITHIN THE SAME FREQUENCY AND DISTANCE RANGE.

TO REPLACE IN PART: SPEZ 445 B BS

TRANSPORTATION: AS PACT SET OR IN VEHICLE. IT CAN BE CARRIED BY ONE PERSON OR PACKED IN TWO CASES AND CARRIED SEPARATELY.

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
HALF KNAPSACK WITH RECEIVER	10"	14 1/2 "	8 1/2 "	25 #
HALF KNAPSACK WITH ACCESSORIES	9"	14 1/2 "	9 "	26 1/2 #
VIBRATOR TYPE E.W. O POWER SUPPLY	3"	6 "	9 "	8 #

COMBINED WEIGHT OF COMPONENTS:

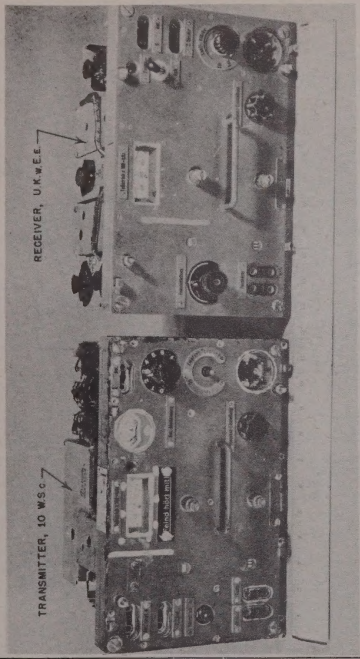


TORN. E. b. (GROUND RECEIVER) SHOWING RECEIVER, CASE AND VIBRATOR PACK.

REMARKS

A PACK-TYPE, GENERAL-PURPOSE RECEIVER NICKNAMED "BERTHA", WITH TUNED V.F. DESIGN AND WITH REGENERATIVE DETECTOR, CAN BE SET UP ON THE GROUND OR USED IN A VEHICLE AS AN INTERCEPT RECEIVER. IT IS A FOUR-TUBE, TUNED R-F RECEIVER CAPABLE OF RECEIVING C-W AND MODULATED SIGNALS OVER A FREQUENCY RANGE OF APPROXIMATELY 97 TO 7095 KILOCYCLES.

THE APPARATUS AND ACCESSORIES ARE WATERTIGHT AND CAN BE BOLTED FIRMLY TOGETHER FOR TRANSPORTATION BY ONE PERSON. HANDLES ARE PROVIDED FOR EACH SECTION SO THAT THEY CAN BE CARRIED SEPARATELY IF DESIRED. CONSIDERING THE LOW BATTERY DRAIN AND CIRCUIT SIMPLICITY, THEIR PERFORMANCE IS GOOD. IT IS ONE OF THE MOST WIDELY USED RECEIVERS IN THE GERMAN ARMY.



RECEIVER Ukw. E.e., SHOWN WITH TRANSMITTER 10 W.S.C.

INSTRUCTIONAL LITERATURE: TB SIG E5

NOMENCLATURE DESIGNATION: (GROUND RECEIVER —TANK) Ukw. E. e. Ukw. E. h.

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) Ukw. E.e 27.2-33.3 IN ONE BAND. Ukw.E.h 23-24.95 IN ONE BAND. DIAL GRADUATION OF Ukw. E. E IN 50 KC INTERVALS; OF Ukw. E. H, 40 FIXED WAVES NUMBERED FROM 241 THROUGH 280 AT 50 KC INTERVALS.

NUMBER OF CRYSTALS:

PRESET FREQUENCIES: 2

ANTENNA: 6½ FOOT ROD

TUNING: (MO OR CRYSTAL)

SENSITIVITY: SELECTIVITY:

POWER SOURCE: 12-VOLT VEHICLE STORAGE BATTERY THROUGH DYNAMOTOR GERMAN TYPE E.U. A OR E.U. A2. CURRENT DRAIN FROM 12-VOLT BATTERY 2.3 AMPERES. POWER REQUIREMENTS, PLATES: 130 VOLTS, 27 MA; FILAMENTS: 12 VOLTS, 1.4 AMPERES; DIAL LAMP 12 VOLTS, 0.35 AMPERE. E.U. A2 DYNAMOTOR RELAY 12 VOLTS, 0.14 AMPERE.

SIMILAR SETS: Ukw. E. c, Ukw. E.d1, Ukw. E. f; ALSO SCR-508(FM) AND SCR-608(FM).

POWER OUTPUT: (WATTS)

TUBES: (TYPE AND NUMBER) 7, TYPE RV 12 P4000, USED AS R-F AMPLIFIER, MIXER, H-F OSCILLATOR, 1ST I-F AMPLIFIER, 2D I-F AMPLIFIER, DETECTOR AND A-F AMPLIFIER. I-F FREQUENCY 3 MC; H-F OSCILLATOR FREQUENCY 3 MC BELOW SIGNAL FREQUENCY.

TACTICAL CHARACTERISTICS

USE: THESE RECEIVERS AND TRANSMITTERS - 10 W.S. C AND 10 W.S. H - ARE USED IN ARMORED VEHICLES, IN TANKS FOR COMMUNICATION BETWEEN TANK COMPANY AND TANK BATTALION HEADQUARTERS, AND IN STATIONARY INSTALLATIONS FOR SHORT-RANGE COMMUNICATION WITH MARINE STATIONS. THEY CAN BE USED IN NETS WITH AMERICAN AMPLITUDE-MODULATED RADIO SETS WITHIN THE FREQUENCY AND DISTANCE RANGE.

TYPE OF SIGNAL: TONE AND VOICE, AMPLITUDE MODULATED, CAN BE RECEIVED.

RANGE: (MILES)

TO COMMUNICATE WITH:

TO REPLACE IN PART:

TRANSPORTATION: IN TANKS.

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
RECEIVER	7 1/2"	12 1/2"	7"	22 #
DYNAMOTOR	4 1/2"	8 "	14"	14 #
COMBINED WEIGHT OF COMPONENTS:				

REMARKS

SUPERHETERODYNE RECEIVER, TELEFUNKEN PRODUCT. RECEIVER AND TRANSMITTER CHASSIS ARE EACH CONTAINED IN STRONG CASE, COVER OF WHICH CLIPS TO FRONT PANEL. NO LUGS OR PROJECTIONS, SINCE MOUNTING ARRANGEMENTS ARE BUILT INTO THE TANKS. ON TOP OF EACH CASE IS A PAIR OF BRASS STRIPS FOR GROUNDING PURPOSES. TWO CABLES PROVIDE NECESSARY CONNECTIONS BETWEEN TRANSMITTER AND RECEIVER - ONE FOR SIDETONE AND THE OTHER FOR THE ANTENNA. SOME MODELS ARE PROVIDED WITH AN INTERPHONE SYSTEM FOR INTERCOMMUNICATION BETWEEN MEMBERS OF THE TANK CREW.

U. Kw. E. d1 (GROUND RECEIVER)

NOMENCLATURE DESIGNATION:

INSTRUCTIONAL LITERATURE:

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 42.2-47.8

NUMBER OF CRYSTALS:

PRESET FREQUENCIES: 2 ADJUSTABLE FLICK-FREQUENCY POSITIONS.

ANTENNA:

TUNING: (MO OR CRYSTAL)

SENSITIVITY: 1 UV/MW OUTPUT

SELECTIVITY:

POWER SOURCE: DYNAMOTORS EUA, EUA1 OR EUA2 OR 130-VOLT "B" BATTERIES AND 12-VOLT STORAGE BATTERY.

SIMILAR SETS: U. KW. E. E, C AND H

POWER OUTPUT: (WATTS)

TUBES: (TYPE AND NUMBER) 9 RV 12 P 2000

TACTICAL CHARACTERISTICS

USE: IN AIR-GROUND LIAISON FOR ARTILLERY UNITS AND ARMORED DIVISIONS.

TYPE OF SIGNAL: TONE AND VOICE.

RANGE: (MILES)

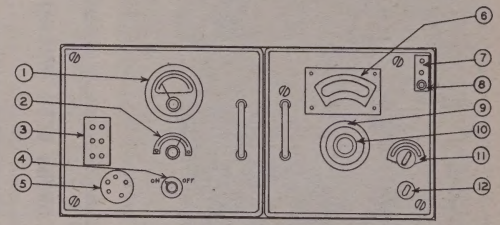
TO COMMUNICATE WITH: TO RECEIVE 20 W-S.D. AND 120 W-S.C.

TO REPLACE IN PART:

TRANSPORTATION: IN TANKS AND ARMORED VEHICLES.

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
OVER-ALL WEIGHT 20 #				
COMBINED WEIGHT OF COMPONENTS:				

U. Kw. E. d1 (GROUND RECVR.) CONTROL PANEL

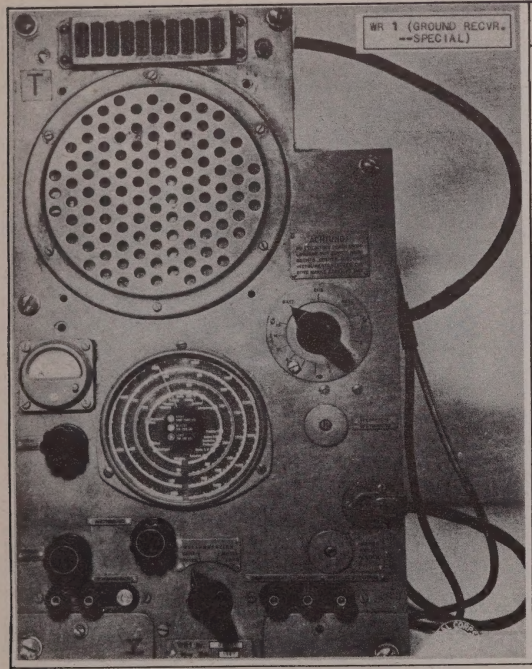


(1) H.T. & L.T. VOLTMETER
(2) VOLUME
(3) PHONE SOCKET
(4) ON-OFF SWITCH
(5) H.T. & L.T. PLUG
(6) FREQUENCY SCALE
(7) ANTENNA SOCKET
(8) ANTENNA SWITCH
(9) FINE TUNING
(10) MAIN TUNING
(11) FLICK FREQ. INDICATOR
(12) FLICK FREQ. ADJUSTMENT

(NOTE: THE DRAWING SHOWN ON THIS PAGE WAS MADE AS NEARLY ACCURATE AS POSSIBLE FROM THE ONLY SOURCE AVAILABLE, - A BLURRED, INDISTINCT PHOTOSTAT PRINT.)

REMARKS

THE U. KW. E. D1 IS A NINE-TUBE HETERODYNE RECEIVER WITH H-F OSCILLATOR, MIXER, THREE I-F STAGES, 2ND DETECTOR, AVC AND AUDIO STAGE. THE I-F TRANSFORMERS CONSIST OF INDUCTIVELY TUNED, CAPACITY-COUPLED COILS IN AN EXTREMELY SMALL CONTAINER. THE RECEIVER IS OF UNIT TYPE, DIE-CAST CONSTRUCTION; THE R-F SECTION, THE I-F STAGES AND AUDIO STAGES ARE EACH IN A DIE-CAST FRAME WITH TOP AND BOTTOM COVERED WITH ALUMINUM PLATES AND INPUT, OUTPUT AND VOLTAGE SUPPLY LEADS BROUGHT OUT ON A PIN PLUG. EACH UNIT PLUGS AND BOLTS INTO LARGE ASSEMBLY. THIS RECEIVER IS USED WITH THE TRANSMITTER 20 W-S.D.



INSTRUCTIONAL LITERATURE:

NOMENCLATURE DESIGNATION: (GROUND RECVR. —SPECIAL) WR 1

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 0.15-15.8

NUMBER OF CRYSTALS: None

PRESET FREQUENCIES: None

ANTENNA: Wire

TUNING: (MO OR CRYSTAL)

SENSITIVITY: SELECTIVITY:

POWER SOURCE: An elaborate switching arrangement provides for any one of a variety of power sources including batteries.

SIMILAR SETS: None, this being strictly a commercial receiver.

POWER OUTPUT: (WATTS)

TUBES: (TYPE AND NUMBER) Two DF 11, one DDD 11, one DCH 11 one DAF 11.

TACTICAL CHARACTERISTICS

USE: For broadcast reception for entertainment and propaganda purposes at rear echelon.

TYPE OF SIGNAL: Voice, amplitude-modulated.

RANGE: (MILES)

TO COMMUNICATE WITH: To receive broadcasts designed for home consumption only.

TO REPLACE IN PART:

TRANSPORTATION: Man pack.

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
Receiver in carrying case	10"	15"	18 1/2"	28 #
COMBINED WEIGHT OF COMPONENTS:				

REMARKS

The construction of this set is inferior to other German military equipment. It is probably a commercial design taken over for military use. On the carrying case, the following notice, in German, is printed:

WARNING!

Use of this Radio for foreign station reception is a crime against the national safety. By order of Der Fuhrer such use will be punished with severest penalty.

SOLDIERS, BEWARE!

L & MW. P/24b-313 (D/F RECEIVER)

NOMENCLATURE DESIGNATION:

INSTRUCTIONAL LITERATURE:

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) .075 to 3.333 in 5 bands. Band I: 69-150 kc/s; Band II: 150-343 kc/s; Band III: 330-775 kc/s; Band IV: 720-1680 kc/s; Band V: 1580-3620 kc/s.

NUMBER OF CRYSTALS:

PRESET FREQUENCIES:

ANTENNA: S: 3--2 rotating loop aerials 1 meter square, insulated copper tubing, set at right angles to each other, one for DF and one for "sense" determination; 1 "stand-by" or auxiliary aerial, vertical rod 1 meter long or horizontal wire 3 meters long.

TUNING: (MO OR CRYSTAL) MO

SENSITIVITY: Maximum (Output of 4v into 4000 ohm resistance for following imputs: 2/10 mV from A_1 and 4/30 mV A_2 (transmitters with note of approximately 1000 c/s.

SELECTIVITY: High

POWER SOURCE: Edison storage battery 4.8 NC 10 for heater voltage to tubes; 3 30-v or 1 90-v battery for plate voltage.

SIMILAR SETS: See Telefunken (1938) catalog-Type IIIN.

POWER OUTPUT: (WATTS) Consumption low voltage imput-0.45 amp; Plate current 18 mAmp.

TUBES: (TYPE AND NUMBER) 6 Tubes of 2 types--3 RE 084K (1 LF amplifier, 1 detector, 1 heterodyne) and 3 RES 094 (1 HF, 1 mixer, 1 IF). The anodes of all tubes lie in a common circuit carrying voltage of 100.

TACTICAL CHARACTERISTICS

USE: For DF and "sense" determination; to receive signals from and to take bearings on CW transmitters within the limits of the wave band of .075-3.333 mc/s.

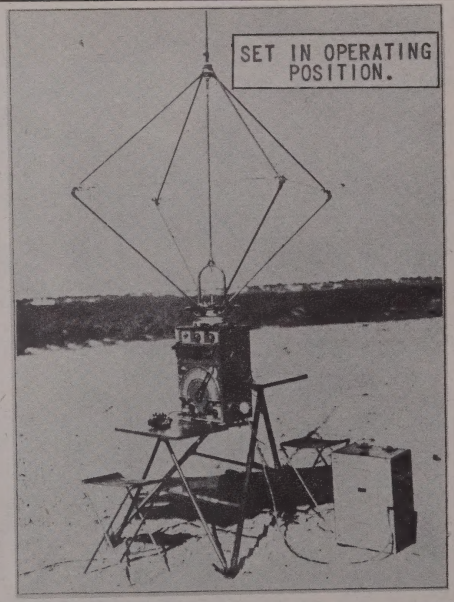
TYPE OF SIGNAL: Tone

RANGE: Miles

TO COMMUNICATE WITH: DF on transmitters.

TO REPLACE IN PART:

TRANSPORTATION: portable - packed in 4 containers - can be hand carried. Stationary - can be installed in tent, hut or vehicle.



L. & M.W. P/24b -313 (D/F RECEIVER)

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
Cross loop Antenna (in case)	39 1/2"	5 1/4"		16# 2 oz
DF receiver (in case)	21 "	DIAMETER 14 1/2"	8 5/8"	49# 6 oz
"Stand-by" or auxiliary aerial Rod 1 meter long or wire 3 meters long.				
COMBINED WEIGHT OF COMPONENTS:				118# 10 oz

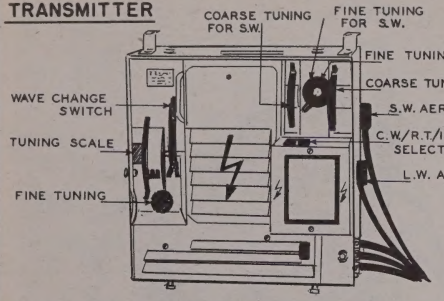
REMARKS

Set packed in 4 portable containers: receiver pack; accessories pack; container with tripod, and container with antenna. DF greatly simplified by use of rotatable cross-loop antenna - one loop used for direction finding and other at right angles for determining "sense" of a transmitting station. This can be accomplished by throwing a switch. When taking bearing on a CW transmitter, the performance of the receiver in terms of minimum width for effective field strength is approx. 5 mV/meter for .5° minimum width in all frequency ranges. Function of the "stand-by" antenna is to reduce azimuth errors caused by local reflection echoes.

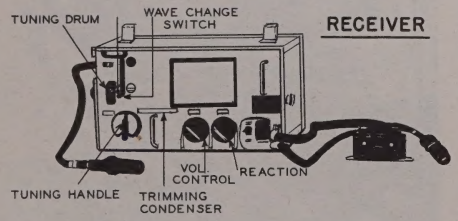
For direction finding, switch over to "Ein" (on); adjust low voltage control to 4 v (red mark on meter); tune in to required station; adjust until suitable signal strength is obtained; swing antenna loop round and note as nearly as possible position where signal is minimum. If minimum is not clear and sharp, regulate by rotating antenna alternately one way and then the other, at the same time adjusting DF control knob "Regler fur Peilen"; When minimum position is found, read off bearing indicated on the scale.

Wiring diagram available.

TRANSMITTER



RECEIVER



FuG 3 (AIRBORNE TRANS.-RECVR.)

INSTRUCTIONAL LITERATURE:

NOMENCLATURE DESIGNATION: (AIRBORNE TRANS-RECVR.) FuG 3

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 0.3-0.6 AND 3.0-6.0. TRANSMITTER AND RECEIVER MUST OPERATE ON THE SAME FREQUENCY.

NUMBER OF CRYSTALS: NONE

PRESET FREQUENCIES: NONE

ANTENNA: BOTH FIXED AND TRAILING.

TUNING: (MO OR CRYSTAL) MANUAL MO

SENSITIVITY: SELECTIVITY:

POWER SOURCE: AIR-DRIVEN GENERATOR (G3) FOR TRANSMITTER. BATTERIES 2-90 VOLTS; 4 VOLTS EDISON FOR RECEIVER.

SIMILAR SETS: FuG 3A AND FuG 32U.

POWER OUTPUT: (WATTS) 100 WATTS (HIGH) AND 20 WATTS (LOW).

TUBES: (TYPE AND NUMBER) 3 RS 31 G, 3 R 2074 AND 1 R-2134.

TACTICAL CHARACTERISTICS

USE: IN BOMBER AIRCRAFT. IT HAS BEEN FOUND IN SOME, BUT NOT ALL SPECIMENS OF THE FOLLOWING TYPES OF AIRCRAFT: Ju 52, FW 58, HE 111, Do 11, Do 13, Do 17 E AND F, Ar 66, Ar 96, W 33, AND W 34.

TYPE OF SIGNAL: CW, TONE AND VOICE.

RANGE: (MILES)

TO COMMUNICATE WITH: PLANE TO PLANE, PLANE TO GROUND.

TO REPLACE IN PART: REPLACED BY FuG 10.

TRANSPORTATION: AIRBORNE

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
COMBINED WEIGHT OF COMPONENTS:				

REMARKS

FuG 3 WAS THE EQUIPMENT IN WHICH THE GERMANS FIRST USED THE TWO FREQUENCY BANDS 0.3-0.6 AND 3.0-6.0 FOR GENERAL COMMUNICATION PURPOSES. THIS POLICY IS STILL IN EVIDENCE; MOREOVER, ONLY LONG-RANGE AIRCRAFT HAVE EXTRA FREQUENCY COVERAGE. IT WAS IN THIS EQUIPMENT ALSO THAT THE MOTOR GENERATOR WAS INTRODUCED, ORIGINALLY TO SUPPLEMENT THE AIR-DRIVEN GENERATOR FOR EMERGENCY USE OF THE TRANSMITTER ON THE GROUND OR WATER. IT HAS BECOME THE NORMAL METHOD OF SUPPLY FOR BOTH TRANSMITTER AND RECEIVER IN THE AIR.

THE ORIGINAL FuG 3 WAS MODIFIED TO FuG 3A AND THEN TO FuG 3AU WHEN THE MOTOR GENERATOR WAS INCLUDED. BOTH FuG 3A AND FuG 3AU ARE STILL IN USE IN TRANSPORT AIRCRAFT, IN FLYING BOATS AND SECOND-LINE OBSOLESCENT AIRCRAFT GENERALLY. THE MODIFICATIONS INCLUDED IN THE FuG 3A WERE THE ADDITION OF AN ANTENNA UNIT AZG 1 WITH A SEND-RECEIVE RELAY WHICH PERMITTED THE RECEIVER AND TRANSMITTER TO OPERATE ON DIFFERENT FREQUENCIES, PLUS "LISTENING THROUGH" FACILITIES; THE ADDITION OF AN IMPULSE UNIT JZG 1; THE PROVISION FOR BACK TUNING THE TRANSMITTER TO THE RECEIVER WITH THE TRANSMITTER ON LOW POWER AND THE RECEIVER ON LOW GAIN; SEPARATE COARSE AND FINE TUNING FOR BOTH LONG AND SHORT WAVES; AND A 3-POSITION SELECTOR SWITCH.

FuG 7 / FuG 7a (AIRBORNE TRANS.-RECVR.)

NOMENCLATURE DESIGNATION:

INSTRUCTIONAL LITERATURE:

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 2.5-3.75 FOR BOTH TRANSMITTER AND RECEIVER.

NUMBER OF CRYSTALS: NONE

PRESET FREQUENCIES: PRESET ON ONE FREQUENCY ON THE GROUND IN FIGHTER AIRCRAFT; IN DIVE BOMBERS THE SET IS ACCESSIBLE DURING FLIGHT.

ANTENNA: FIXED ANTENNA IN FIGHTER AIRCRAFT; IN DIVE BOMBERS A TRAILING ANTENNA, MANUALLY REELED.

TUNING: (MO OR CRYSTAL) MO

SENSITIVITY: ABOUT 60 MV FOR 1 MW OUTPUT. (30% MODULATION).

SELECTIVITY: 20 DB DOWN, 20 KC TOTAL BAND WIDTH.

POWER SOURCE: DYNAMOTOR U 4A/24 SUPPLIES BOTH TRANSMITTER AND RECEIVER.

SIMILAR SETS: REPLACED BY FuG 16Z

POWER OUTPUT: (WATTS) 20 (GERMAN RATING); 2½ (BRITISH TESTS).

TUBES: (TYPE AND NUMBER) TRANSMITTER, 2 REN 904 AND 2 RENS 1664; RECEIVER, 5 RENS 1264.

TACTICAL CHARACTERISTICS

USE: IN FIGHTERS AND DIVE BOMBERS. PRIOR TO 1943 FuG 7A WAS FITTED IN ME 109, ME 109F, FW 190. IT IS STILL FITTED IN JU 87 AND HS 129.

TYPE OF SIGNAL: TRANSMITTED, CW AND VOICE; RECEIVED, TONE AND VOICE.

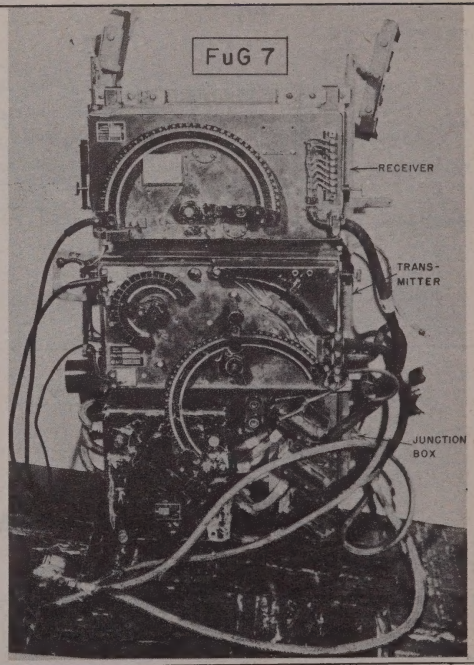
RANGE: (MILES) ABOUT 15 OR EVEN LESS, DUE TO THE PRESET RECEIVER.

TO COMMUNICATE WITH: GROUND STATIONS AND OTHER AIRCRAFT.

TO REPLACE IN PART: FuG 6.

TRANSPORTATION: AIRBORNE

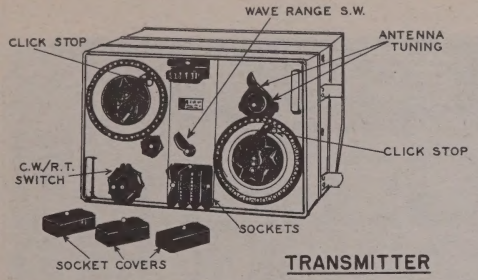
PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
TRANSMITTER (S-6B)	8"	14"	9"	20 #
RECEIVER (E-5A)	8"	14"	9"	25 #
JUNCTION BOX (VK-5A)	8"	8"	9"	5 #
DYNAMOTOR (U-LB/24)	8 1/2"	9 1/2"	5"	
COMBINED WEIGHT OF COMPONENTS:				



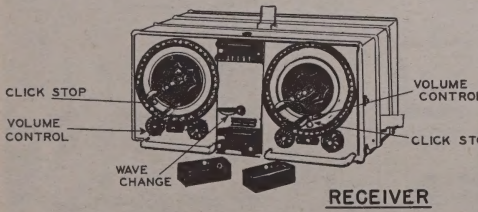
REMARKS

FuG 7A WAS THE STANDARD EQUIPMENT IN SINGLE-SEATER AIRCRAFT (ME 109) AT THE BEGINNING OF THE WAR AND WAS SO USED UNTIL 1943. ON THESE AIRCRAFT IT PROVIDED VOICE COMMUNICATION ONLY. THE MAIN CONSIDERATION IN ITS DESIGN SEEMS TO HAVE BEEN SIMPLICITY OF OPERATION, THE PILOT BEING RESPONSIBLE ONLY FOR "SEND-RECEIVE" AND VOLUME CONTROL. THE TRANSMITTER AND RECEIVER WERE PRESET AND THE LACK OF FINE TUNING, IN THE ABSENCE OF CRYSTAL CONTROL PREVENTED PILOTS FROM GETTING THE MOST OUT OF THIS APPARATUS. ITS REPLACEMENT BY FuG 16Z LAST YEAR WAS LONG OVERDUE.

IT IS STILL USED, HOWEVER, IN TWIN-SEATER AIRCRAFT PARTICULARLY THE JU 87. IT CAN BE TUNED IN FLIGHT BY THE WIRELESS OPERATOR AND IS ADAPTED TO CW AS WELL AS TWO-WAY VOICE TRANSMISSION.



TRANSMITTER



RECEIVER

(NOTE: THE DRAWING SHOWN ON THIS PAGE WAS MADE AS NEARLY ACCURATE AS POSSIBLE FROM THE ONLY SOURCE AVAILABLE - A BLURRED, INDISTINCT PHOTOSTAT PRINT.)

FuG 8 (AIRBORNE TRANS.-RECVR)

INSTRUCTIONAL LITERATURE:

NOMENCLATURE DESIGNATION: (AIRBORNE TRANS.-RECVR.) FuG 8

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (MC) SHORT-WAVE (RED) 3.0-6.0; LONG WAVE (BLUE) 0.3-0.6. SAME FREQUENCIES USED FOR BOTH TRANSMITTING AND RECEIVING.

NUMBER OF CRYSTALS: NONE

PRESET FREQUENCIES: CLICK TUNING TO 2 COMMONLY USED FREQUENCIES IN BOTH LONG AND SHORT WAVE RANGES.

ANTENNA: COMMON T AND R WITH AUTOMATIC CHANGE FROM TRANSMISSION TO RECEPTION. WHEN KEY IS "ON", ANTENNA IS CONNECTED WITH TRANSMITTER, WHEN "OF", WITH RECEIVER. FIXED OR TRAILING ANTENNA MAY BE USED. FIXED NORMALLY PROVIDES SHORT WAVE BUT WHEN USED WITH SPOOL FOR LENGTHENING COIL LONG WAVE IS POSSIBLE. TRAILING ANTENNA, ADJUSTABLE TO 77 YARDS, PROVIDES SHORT OT LONG WAVE.

TUNING: MO. SENSITIVITY: SELECTIVITY:

POWER SOURCE: DYNAMOTOR (U5) SUPPLIES 370 VOLTS, 270 MA. TO TRANSMITTER; DYNAMOTOR (U6) SUPPLIES 210 VOLTS 180 MA. TO RECEIVER.

SIMILAR SETS: FuG 3, 3a, 3a u, 5, 5a, 5a u, 10.

POWER OUTPUT: (WATTS) 40 (LONG WAVE); 20 (SHORT WAVE).

TUBES: (TYPE AND NUMBER) TRANSMITTER: 9 DIRECTLY HEATED OXIDE CATHODES--RS 242 (HEATER VOLTAGE 3.8, HEATER CURRENT 0.65 AMP., MAXIMUM PLATE VOLTAGE 400) AND ONE SPECIAL NEON LAMP FOR "LISTENING THROUGH" ARRANGEMENT. RECEIVER: 7 INDIRECTLY HEATED CATHODES - 4 NF2 & 3 NF3 (HEATER VOLTAGE 13.0, HEATER CURRENT 0.2 AMP., MAXIMUM PLATE VOLTAGE 200, MAXIMUM SCREEN GRID VOLTAGE 100).

TACTICAL CHARACTERISTICS

USE: AIR-TO-AIR, AIR-TO-GROUND, ON BOTH LONG AND SHORT WAVES; INTERCOMMUNICATION BETWEEN MEMBERS OF CREW. IT IS BELIEVED THAT THIS GENERAL-PURPOSE EQUIPMENT WAS INTENDED FOR BOMBERS, BUT WAS EARLY SUPERSEDED BY FuG 10. NO MODIFICATIONS OR SUBTYPES OF FuG 8 APPEAR TO EXIST.

TYPE OF SIGNAL: TRANSMITTED (LONG WAVE) CW; TRANSMITTED (SHORT WAVE) CW AND VOICE. RECEIVED: CW, TONE AND VOICE. INTERCOMMUNICATION, VOICE. SIMULTANEOUS RECEPTION OF LONG AND SHORT WAVES.

RANGE: (MILES)

TO COMMUNICATE WITH: AIRCRAFT AND GROUND STATIONS COVERING THE SAME FREQUENCY BAND.

TO REPLACE IN PART: REPLACED BY FuG 10.

TRANSPORTATION: AIRBORNE.

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT

COMBINED WEIGHT OF COMPONENTS:

REMARKS

FuG 8 PROVIDES SIMULTANEOUS RECEPTION OF SHORT AND LONG WAVES; IT HAS AN INBUILT SECTION FOR INTERCOMMUNICATION BETWEEN MEMBERS OF THE CREW.

EQUIPMENT COMPRISES TRANSMITTER S.7KL; RECEIVER E.6KL; TRANSMITTER ROTARY TRANSFORMER (UMFORMER U5); RECEIVER UMFORMER U6; SWITCH BOX Sch K.6; KEYING APPARATUS TG5; JUNCTION BOX ADB 10; DISTRIBUTION BOX VD 2; PRESS BUTTON TB1; ANTENNA CURRENT METER SchA.2; DECOUPLING UNIT DK 4c; ANTENNA LENGTHENING UNIT ASp 2; ANTENNA WINCH AH 5 AND ANTENNA SHAFT ASch 2.

TRANSMITTER AND RECEIVER ARE SIMILARLY CONSTRUCTED IN 3 SECTIONS EACH - SHORT-WAVE SECTION (RED TUNING SCALE) ON LEFT, LONG-WAVE SECTION (BLUE) ON RIGHT, SEPARATED BY SWITCHING SECTION WHICH IS COMMON TO BOTH.

TRANSMITTER CIRCUITS ARE AS FOLLOWS: FOR THE SHORT-WAVE SECTION, ONE OSCILLATOR STAGE AND TWO H-F AMPLIFIER STAGES, THE SECOND OF WHICH CONSISTS OF TWO TUBES IN PUSH-PULL; FOR THE LONG-WAVE SECTION, ONE OSCILLATOR STAGE AND ONE H-F AMPLIFIER STAGE (THREE TUBES IN PARALLEL); FOR THE SWITCHING SECTION, ONE 1-F AMPLIFIER STAGE FOR TELEPHONE ON SHORT WAVE AND FOR INTERCOMMUNICATION, AND ONE RELAY FOR AUTOMATIC CHANGE-OVER OF ANTENNA FROM TRANSMITTER TO RECEIVER AND VICE VERSA. RECEIVER CIRCUITS ARE AS FOLLOWS: FOR THE SHORT-WAVE SECTION, TWO H-F AMPLIFIERS AND ONE AUDIO STAGE; FOR THE LONG-WAVE SECTION, ONE H-F AMPLIFIER STAGE AND ONE AUDIO STAGE FOR THE SWITCHING SECTION, ONE 1-F AMPLIFIER STAGE COMMON TO SHORT-AND-LONG-WAVE SECTION, AND ONE AMPLITUDE CONTROL FOR SHORT-WAVE SECTION ONLY.

PRESSING THE KEY OF A SPECIAL SWITCH ON THE KEYING APPARATUS TG 5 CHANGES THE SIGNAL FROM CW TO VOICE. THE KEYING SOUNDS OF ONE'S OWN TRANSMISSIONS CAN BE HEARD AT APPROXIMATELY 1000 CPS IN THE HEADPHONES THROUGH CONDENSERS THAT PRODUCE A TONE IN RHYTHM WITH THE KEYING. THIS LISTENING THROUGH IS NOT EFFECTIVE DURING TELEPHONY.

NO TELEPHONY IS PROVIDED ON THE LONG-WAVE SECTION OF THE TRANSMITTER. WHEN THE RECEIVER IS SWITCHED ON, THE TELEPHONE AMPLIFIER IS ALWAYS READY FOR USE AND PERMITS INTERCOMMUNICATION BETWEEN MEMBERS OF THE CREW DURING CW ON THE SHORT-AND-LONG-WAVE SECTIONS OF THE TRANSMITTER AS WELL AS DURING RECEPTION. MICROPHONES AND TELEPHONES OF THE CREW ARE CONNECTED IN PARALLEL FOR THIS PURPOSE.

FuG 10 (AIRBORNE TRANS.-RECVR.)

NOMENCLATURE DESIGNATION:

INSTRUCTIONAL LITERATURE:

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) Transmitters: long wave (S-10L) 0.3-0.6, short wave (S-10K) 3.0-6.0; Receivers: long wave (E-10L) 0.3-0.6, short wave (E-10K) 3.0-6.0.

NUMBER OF CRYSTALS: None

PRESET FREQUENCIES: Four click stops on tuning dials.

ANTENNA: Both fixed and trailing. Electrically operated reel adjusts length of trailing antenna. Tuning units AAG-2 and AAG-3 are provided at antenna bases.

TUNING: (MO or CRYSTAL) MO. Manual with 4 click stops on each transmitter and receiver. Antenna matching units tuned remotely by selsyn system.

SENSITIVITY: 1 uv for 50 mw output.

SELECTIVITY: of E-10L is 6 db down 2.0 kc total band width; of E-10K is 6 db down 27 kc band, 30 db down 240 kc band.

POWER SOURCE: Transmitters: Dynamotor U-10/S gives 870 volts 130 milliamperes, 230 volts 40 milliamperes. By rectification from slip rings, 280 volts d-c for bias. 110 volts 300 cycles for Selsyns. Dynamotor U-10/E gives 210 volts 125 milliamperes for receivers.

SIMILAR SETS: FuG 3 and FuG 8

POWER OUTPUT: (WATTS) Long wave 70, short wave 40.

TUBES: (TYPE AND NUMBER) 31. Six RL 12 P 35 and twenty-five RV 12 P 2000. These tubes perform well over a frequency range of 200 kc to 400000 kc. The receiver tubes function as R-F amplifier, detector and audio amplifier for both pentode and triode operation.

TACTICAL CHARACTERISTICS

USE: Current equipment for all first-line, multiple-engine aircraft. It has been found in all bombers, twin-engine fighters and certain flying boats.

TYPE OF SIGNAL: Transmitted, CW on both long- and short-wave; Received, CW on both long and short wave; tone and voice also received on short wave.

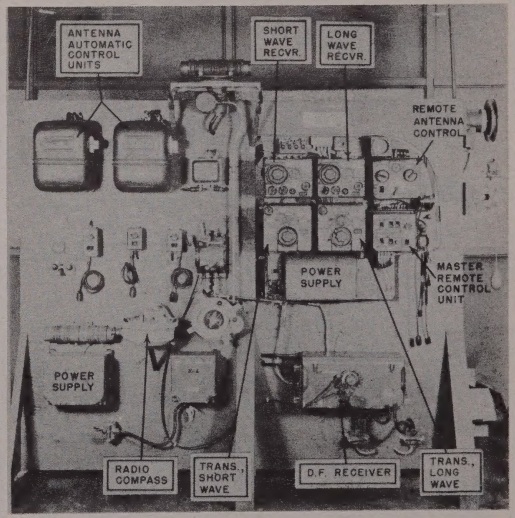
RANGE: (MILES) 350 to 500.

TO COMMUNICATE WITH: Aircraft and ground stations.

TO REPLACE IN PART: FuG 3 and FuG 5.

TRANSPORTATION: Airborne

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
Transmitters S10K and S10L, each	9"	8 3/4"	8"	16 #
Receivers E10K and E10L, each	7 1/4"	8 3/4"	8"	16 1/2#
Dynamotor U10/S	9"	13 1/4"	6 1/2"	28 1/2#
Dynamotor U10/E.	6 1/2"	10 1/4"	4 1/2"	13 1/2#
COMBINED WEIGHT OF COMPONENTS:				270 #



FuG 10 (AIRBORNE TRANSMITTER-RECEIVER)

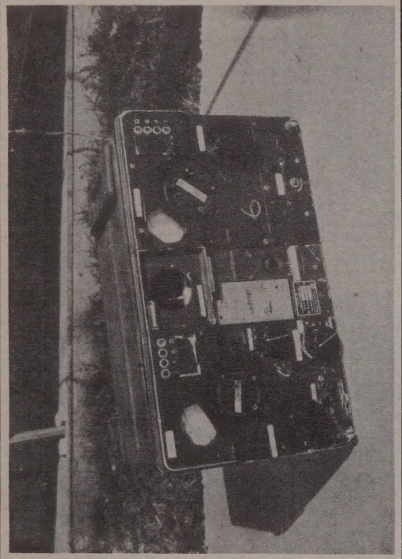
REMARKS

FuG 10 is the present standard general-purpose set. It appeared at the beginning of the war and represents a remarkably high standard of planning and production. Short- and long-wave coverage is by two transmitters and two receivers, one transmitter and receiver operating on the 0.3 to 0.6 mc band and the other on the 3.0 to 6.0 mc band. A remote-controlled direction finder operates in the 0.1 to 1.1 mc band and a blind-landing device operates in the 28 to 32 mc band. There is also an interphone system which supplies communication to the crew and serves to interrupt CW transmission for purposes of ground homing.

The set is not crystal-controlled, relying on capacitance compensation for frequency stability. A predetermined spot on a dial can be tuned to a master signal station which is undoubtedly maintained on frequency by crystal control. This also corrects the calibration of the two receivers. The transmitters are operated at low power and tuned to zero beat with the receivers. This can be done during flight to compensate manually for temperature and humidity changes. The radio operator controls receivers and transmitters. Each transmitter-receiver unit is constructed so that 4 channels may be quickly selected. The navigator controls the blind landing and homing equipment. There is no indication of dual operation.

The transmitters are tuned by iron-cored variometers. The receivers are 8-tube superheterodynes, consisting of R-F amplifier, frequency changer, temperature-compensated-oscillator, two I-F stages (140 and 1400 kc), anode bend detector, heterodyne oscillator and output. There is no AVC. The audio amplifier contains an intercommunication amplifier, sidetone and pulse circuits. The sidetone circuit is a 900-cycle Hartley oscillator fed into the intercommunication circuit when the key is depressed. The pulse circuit generates 300-cycle, 500-microsecond pulse to modulate the long-wave transmitter.

In later models the short-wave receiver has an additional I-F stage, an AVC stage and an additional output tube. Additional transmitters and receivers are also carried on separate mountings and require special antenna matching units for ranges 5.3-10.0, 6-12 or 6-18 mc.



FuG 16 (AIRBORNE TRANS.-RECVR.) SHOWING RECEIVER, MODULATOR & TRANSMITTER, (LEFT TO RIGHT)

INSTRUCTIONAL LITERATURE:

NOMENCLATURE DESIGNATION: (AIRBORNE TRANS.-RECVR.) FuG 16

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) Calibrated at 38.5-42.3; actually 38.0-42.5 for both transmitter and receiver.

NUMBER OF CRYSTALS: None

PRESET FREQUENCIES: Four click stops on tuning dials.

ANTENNA: Fixed single wire 6' 11" long. The antenna matching unit - AAG-16 - enables the antenna to perform the additional function of sense antenna of the separate D/F receiver that is carried on bomber aircraft.

TUNING: (MO or crystal) Manual, with 4 click stops on transmitter and receiver.

SENSITIVITY: 9-10 microvolts across input feeder for 1 milliwatt output, 30% modulated signal.

SELECTIVITY: 6 db for 23 kc total band width; 40 db for 73 kc total band width.

POWER SOURCE: Dynamotor U-17 gives 450 volts at 165 amperes for transmitter with 165 volts at 5 milliamperes bias supply; it also provides 210 volts at 165 milliamperes for receiver.

SIMILAR SETS: FuG 7, FuG 7a, FuG 17 and FuG 16Z.

POWER OUTPUT: (watts) 10 (German Rating), 5 (British tests).

TUBES: (type and number) Two RL 12 P 35 and eleven RV 12 P 2000.

TACTICAL CHARACTERISTICS

USE: This equipment is used in all bombers for air-to-air and air-to-ground voice communication.

TYPE OF SIGNAL: Voice only.

RANGE: (miles) 20 at ground level, 100 at approximately 10,000 feet.

TO COMMUNICATE WITH: Aircraft and ground stations

TO REPLACE IN PART: It replaces FuG 17.

TRANSPORTATION: Airborne

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
Transmitter, receiver and modulator in one case	8 "	15 "	8 1/4 "	26 1/2 #
Dynamotor	8 "	10 "	9 "	15 #
Antenna matching unit	5 5/8"	5 5/8"	2 3/8 "	2 1/2 #
COMBINED WEIGHT OF COMPONENTS:				44 #

REMARKS

FuG 16 is in current use to provide voice communication for large aircraft and is fitted in such aircraft in addition to FuG 10. Its design was taken from FuG 17 from which it differs mainly in the lack of the MCW function and in the frequency range (FuG-16 frequency range ends where FuG 17 commences, at 42 Mc.) Structurally it makes use of the chassis and components of FuG 17 and the power unit and mounting frames still retain their type 17 nomenclature, although the FuG 16 must now greatly outnumber the FuG 17.

Where possible FuG 16 is mounted for manual operation but this is not possible in the majority of the aircraft to which it is fitted. In such cases, a remote fine tuning control for the receiver has now become standard.

The main unit of the equipment consists of three components - the transmitter (S-16) on the right, the receiver (E-16) on the left and modulator and meter unit (BG-16) in the center. The transmitter consists of a pentode MO and frequency doubler which feeds into a pentode power amplifier. Modulation is on the grid of the output stage. Audio power is from the center unit which contains an amplifier and modulator stage, together with a radiation meter which is a D-C type excited from a current transformer and metal rectifier in the antenna matching unit. The receiver consists of a pentode R-F amplifier, pentode first detector, pentode oscillator, pentode 1st I-F amplifier, pentode 2nd I-F, pentode 3rd I-F and diode 2nd detector. There is a diode AVC rectifier, triode audio amplifier and a neon stabilizer for the oscillator.

FuG 16 Z (AIRBORNE TRANS.-RECVR.)

NOMENCLATURE DESIGNATION:

INSTRUCTIONAL LITERATURE:

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 38.5-42.3 FOR BOTH TRANSMITTER AND RECEIVER.

NUMBER OF CRYSTALS: NONE

PRESET FREQUENCIES: FOUR. CLICK-STOPS ON TUNING DIALS

ANTENNA: SINGLE WIRE 6'11" LONG FROM ANTENNA MATCHING UNIT TO TAIL FIN, OR "T" TYPE ANTENNA WITH 2'8" FEEDER INTO CENTER OF 5'1" HORIZONTAL ELEMENT SUPPORTED BETWEEN TAIL AND COCKPIT COWLING. MATCHING UNITS AAG-16-2 AND AAG-16-3 PERMIT USE OF LEADING EDGE OF TAIL FIN AS ANTENNA. AN 8" SINGLE LOOP IS USED FOR D/F PURPOSES.

TUNING: (MO OR CRYSTAL) MANUAL: WITH 4 CLICK STOPS SET UP ON GROUND. REMOTE: BY A TWO OR FOUR POSITION SELECTOR, MOTOR DRIVEN, OPERATED BY PILOT.

SENSITIVITY: COMMUNICATION: 30 MICROVOLTS ACROSS 50 OHM INPUT TO GIVE 5 MILLIWATTS OUTPUT, 30% MODULATION

SELECTIVITY: 6 DB FOR 23 KC TOTAL BAND WIDTH. 40 DB FOR 75 KC TOTAL BAND WIDTH.

POWER SOURCE: DYNAMOTOR U-17 SUPPLIES 450 VOLTS 165 MILLIAMPERES, 165 VOLTS 5 MILLIAMPERES FOR TRANSMITTER AND 210 VOLTS AT 90 MILLIAMPERES FOR RECEIVER.

SIMILIAR SETS: FuG 16

POWER OUTPUT: (WATTS) 10 (GERMAN RATING); 5 (BRITICH TESTS)

TUBES: (TYPE AND NUMBER) 18--TWO RL 12 P 35 IN THE TRANSMITTER, NINE RV 12 P 2000 IN RECEIVER, SEVEN RV 12 P 2000 IN THE NAVIGATIONAL AID ZVG-16.

TACTICAL CHARACTERISTICS

USE: THIS IS THE STANDARD EQUIPMENT USED IN ALL SINGLE-SEAT FIGHTERS TO PROVIDE VHF SERVICE TO PILOTS, TONE FOR GROUND FIXES AND D/F HOMING ON GROUND STATIONS.

TYPE OF SIGNAL: TRANSMITS TONE AND VOICE; RECEIVES TONE AND VOICE. D/F HOMING ON ANY TYPE OF SIGNAL.

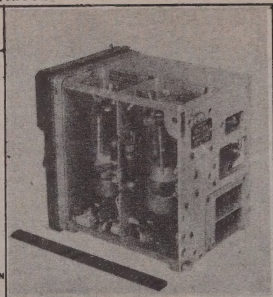
RANGE: (MILES) THE RADIUS OF THE RECEIVER FOR D/F HOMING IS FROM 120 AT 10000 FEET TO 250 AT 40000 FEET. THE RADIUS OF THE TRANSMITTER (WHEN COMMUNICATING WITH FuG 16 RECEIVER) IS FROM 45 AT 1000 FEET TO 200 AT 25000 FEET FOR MCW, AND FROM 40 AT 1000 FEET TO 180 AT 25000 FEET FOR R/T. THE HIGHEST OPERATING HEIGHT IS APPROXIMATELY 45000 FEET.

TO COMMUNICATE WITH: OTHER AIRCRAFT AND GROUND STATIONS. FuG 16 AND 16Z ARE OFTEN USED ON GROUND FOR THIS SERVICE.

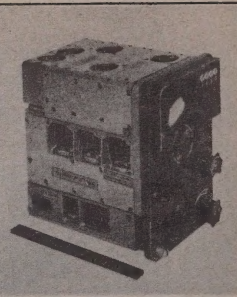
TO REPLACE IN PART: FuG 7, FuG 7a AND FuG 7o.

TRANSPORTATION: AIRBORNE

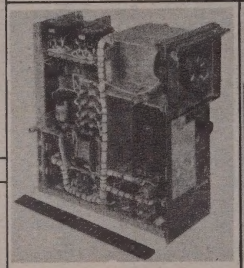
PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
TRANSMITTER RECEIVER AND MODULATOR IN ONE CASE	8"	15"	8 1/4"	26 1/2 #
DYNAMOTOR U-17	8"	10"	9 "	15 #
ANTENNA MATCHING UNIT AAG-16Z	2 3/8"	5 5/8"	5 5/8"	2 1/2 #
MODULATOR UNIT MZ-16	3 1/4"	3 1/2"	3"	1 #
HOMING UNIT ZVG-16	8 1/4"	4 1/2"	8"	6 1/4 #
INDICATOR AFN-2	2 1/2"	2 1/2"	3 1/2"	1 1/2 #
COMBINED WEIGHT OF COMPONENTS:				



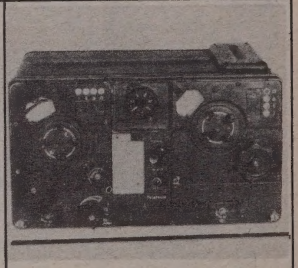
TRANSMITTER S16Z



RECEIVER E16Z



MODULATOR BG16Z



FuG 16Z- ASSEMBLED

FuG 16 Z (AIRBORNE TRANS.-RECVR.)

REMARKS

FuG 16Z, USED IN FIGHTERS, WAS ADAPTED FROM FuG 16 USED IN BOMBERS. BOTH ARE COPIES OF FuG 17 BUT THE TWO ARE NOT INTERCHANGEABLE, THE POWER UNIT U-17 BEING THE ONLY PART IDENTICAL IN ALL THREE SETS.

FuG 16Z USES ONE CHANNEL FOR VOICE AND TWO OTHERS FOR HOMING AND MCW. A COMMON CHANNEL CANNOT BE USED BECAUSE AIRCRAFT MIGHT HOME ON TO EACH OTHER INSTEAD OF ON BASE. WHEN USED WITH NAVIGATIONAL AID ZVG-16 (ANTENNA LOOP PR-16), IT GIVES OFF D/F RECORDINGS ON SHORT-WAVE TRANSMITTERS RADIATING WAVES ON A_1, A_2, & A_3.

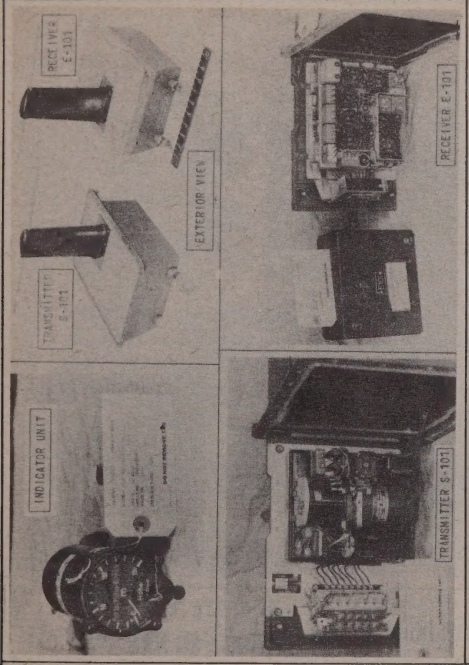
ANTENNA CIRCUIT LOADING OF ABOUT 10 WATTS CAN BE CHANGED OVER TO APPROXIMATELY 0.1 WATT FOR NEARBY STATIONS.

THE RECEIVER IS A 9-TUBE SUPERHETERODYNE WITH THE FOLLOWING STAGES: R-F AMPLIFIER, 1ST DETECTOR, OSCILLATOR, THREE I-F STAGES, 2D DETECTOR, AVC RECTIFIER AND AUDIO AMPLIFIER.

ALTHOUGH PRESET ON THE GROUND BEFORE FLIGHT, TUNING CAN BE ACCOMPLISHED DURING FLIGHT BY TWO OR FOUR CLICK-STOP REMOTE CONTROLS ON FRONT PANEL THROUGH A FREQUENCY CHANGING SWITCH. A SEPARATE REMOTE CONTROL UNIT ON THE GROUND FITTED TO THE FINE TUNING CONTROL OF THE RECEIVER PERMITS THE FREQUENCY OF THE LATTER TO BE ALTERED 30 KC/S TO EITHER SIDE WITHOUT CHANGING THE PRESET TUNING. THE FINE TUNING OF THE RECEIVER INSURES MAXIMUM RECEPTIVITY, IN THE ABSENCE OF CRYSTAL CONTROL.

A SPECIAL WINDING ON THE TRANSFORMER, WHICH IS CONNECTED DIRECTLY TO THE PLUG FOR THE FLYING HELMET, ENABLES THE PILOT TO HEAR THE MODULATION BY "LISTENING THROUGH." AFTER THE RECEIVER HAS BEEN TUNED THE D/F APPARATUS ZVG-16 SHOULD BE CONNECTED ONLY LONG ENOUGH TO RECEIVE A GROUND BEACON STATION.

WHEN OPERATING ON 29 VOLTS, THE ENERGY CONSUMPTION FOR VOICE TRANSMISSION IS 12.5 AMPERES, 360 WATTS; FOR RECEPTION AND D/F, 9 AMPERES, 260 WATTS.



FuG 101 (RADIO ALTIMETER)

INSTRUCTIONAL LITERATURE:

NOMENCLATURE DESIGNATION: (AIRBORNE TRANS-RECVR.) FuG 101 (RADIO ALTIMETER)

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) Operating frequency 370 mc/s; frequency modulated 19 mc/s ± the mean frequency value.

NUMBER OF CRYSTALS:

PRESET FREQUENCIES:

ANTENNA: Two aerials, center-feed modified dipoles, one each for transmitter and receiver.

TUNING: (MO OR CRYSTAL) MO

SENSITIVITY: SELECTIVITY:

POWER SOURCE: Separate power unit containing high voltage generator with three outputs - 210 volts; 140 volts and 250 volts. Filament and motor supplies direct from aircraft 24 volt supply.

SIMILAR SETS: Reflection Radio Altimeter of which "F" Gerate 101 is a development. Original model worked on frequency of 420 mc/s frequency band being swept 60 times per second by means of a small variable condenser or transmitter oscillator.

POWER OUTPUT: (WATTS) Power consumption about 120 watts.

TUBES: (TYPE AND NUMBER) 9--7 RV 12 P 2001, 1 LD 2 and 1 LV 5. Transmitter has 1 LD 2 and 1 RV 12 P 2001; receiver has 1 LV 5 and 6 RV 12 P 2001.

TACTICAL CHARACTERISTICS

USE: To determine height of plane above ground.

TYPE OF SIGNAL: Tone.

RANGE: (MILES) 10-150 meters; 100-1500 meters.

TO COMMUNICATE WITH:

TO REPLACE IN PART:

TRANSPORTATION: In aircraft.

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
Transmitter and receiver units built on separate chassis (including cables)		6.25"	5.8"	
Power Unit on standard tray	4.5"	3.5" (diameter)		
COMBINED WEIGHT OF COMPONENTS:				40#

REMARKS

Radio Altimeter FuG 101 (frequency modulated) transmits radio waves from an airplane to ground and receives waves reflected from ground, the time interval being measured. Since transmitter and receiver are coupled, the direct signal beating with the reflected signal causes a tone which varies in frequency with height, the average frequency being directly proportional to the height of the airplane above the ground.

The altimeter consists of Transmitter (with aerial), Receiver (with aerial), Power Unit and Indicator Unit, all connected by screened cable. Transmitter and receiver 5' 5½" apart, mounted under starboard wing of aircraft, power unit in metal fairing behind undercarriage stowage, indicator unit on instrument panel to left of pilot.

Transmitter consists of aerial, RF oscillator, motor-driven condenser and calibrator system. The frequency of the RF oscillator is varied over about 38 mc/s at rate of about 80 c/s by means of a small split stator motorized condenser. Calibrator consists of an RV 12 P 2001 tube, to grid of which an oscillating voltage is applied, generated by a telephone earpiece mounted under motor unit with pole tips close to flywheel which has on its outside circumference 60 square section teeth.

Receiver comprises detector, amplifier with AVC, output stage, counter rectifier, HF control stage with control rectifier. Detector stage has fairly wide range of frequency modulation. The direct and reflected signals beat together in detector to produce a difference frequency varying from 200 to 20000 c/s.

Three-stage amplifier has a rising characteristic which automatically compensates for decreasing signal strength with increased height of aircraft.

FuG 17 / FuG 17E & Z (AIRBORNE TRANS.-RECVR.)

NOMENCLATURE DESIGNATION:

INSTRUCTIONAL LITERATURE:

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mo) CALIBRATED 42.1-47.9. IT CAN BE TUNED BEYOND THE CALIBRATED RANGE.

NUMBER OF CRYSTALS: NONE

PRESET FREQUENCIES: FOUR. CLICK-STOPS ON TUNING DIALS.

ANTENNA: VERTICAL ROD ABOUT 39" LONG TERMINATING IN ANTENNA MATCHING UNIT AAG-17 CONCENTRIC FEEDER TO FuG 17, 50 OHMS.

TUNING: (MO OR CRYSTAL) MANUAL, WITH 4 CLICK STOPS ON RECEIVER AND TRANSMITTER.

SENSITIVITY: GOOD: 30 MICROVOLTS ACROSS 50 OHM INPUT TO GIVE 5 MILLIWATTS OUTPUT 30% MODULATION.

SELECTIVITY: 6 DB FOR 25 KC TOTAL BAND WIDTH.

POWER SOURCE: DYNAMOTOR U-17 SUPPLIES 450 VOLTS 165 MILLIAMPERES, 165 VOLTS 5 MILLIAMPERES FOR TRANSMITTER AND 210 VOLTS AT 90 MILLIAMPERES FOR RECEIVER.

SIMILAR SETS: FuG 17E

POWER OUTPUT: (WATTS) 10 (GERMAN RATING); 5 (BRITISH TESTS).

TUBES: (TYPE AND NUMBER) 2 RL 12 P35 AND 13 RV 12 P2000.

TACTICAL CHARACTERISTICS

USE: IN TWIN-SEATER, CLOSE SUPPORTING AIRCRAFT TO PROVIDE VOICE AND TONE FROM AIR TO AIR AND FROM AIR TO GROUND. COMMUNICATION IS ALSO PROVIDED BETWEEN LONG-RANGE AIRCRAFT AND SUBMARINES. DF FACILITIES ARE PROVIDED ON CERTAIN LONG-RANGE BOMBERS.

TYPE OF SIGNAL: TONE AND VOICE RECEIVED AND TRANSMITTED.

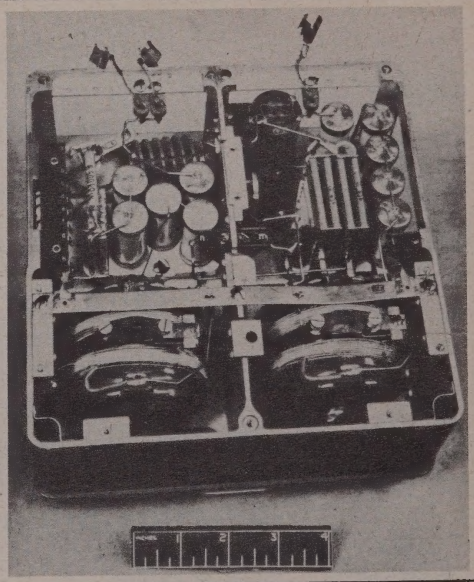
RANGE: (MILES) 30 AT GROUND LEVEL; 185 AT 26000 FEET WITH 20-WATT GROUND STATION.

TO COMMUNICATE WITH: ARMY TYPE C20 W SET. FuG 17, BENCH MOUNTED, IS OFTEN USED.

TO REPLACE IN PART: FuG 7

TRANSPORTATION: AIRBORNE

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
FuG 17 CONSISTING OF TRANSMITTER, RECEIVER AND MODULATOR IN ONE CASE.	8"	15"	8 1/4"	26 1/2 #
DYNAMOTOR U-17	8"	10"	9 "	15 #
ROD ANTENNA AND MATCHING UNIT AAG-17				6 #
COMBINED WEIGHT OF COMPONENTS:				



FuG 17 - FuG 17E & Z
(AIRBORNE TRANS.-RECVR)

REMARKS

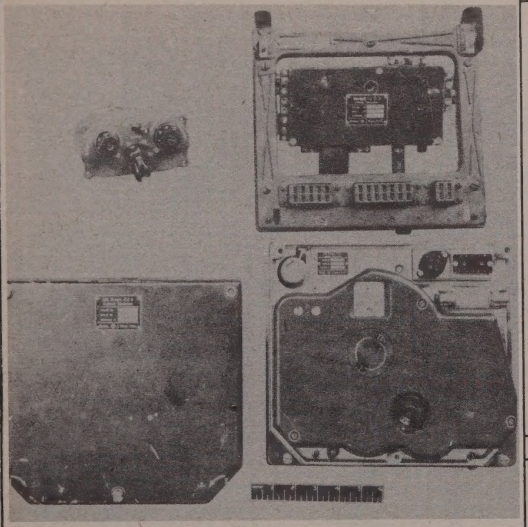
FuG 17 WAS THE ORIGINAL DESIGN FROM WHICH FuG 16 WAS COPIED. BOTH SETS HAVE THE SAME TRANSMITTING AND RECEIVING CIRCUITS EXCEPT THAT THE TRANSMITTER OF FuG 17 HAS A TUNED-PLATE, TUNED-GRID OSCILLATOR, AND THE MODULATOR (BG 17) HAS 4 INSTEAD OF 2 TUBES, ONE BEING A 1000-CYCLE OSCILLATOR, ANOTHER FOR SIDETONE WITH TRANSFORMER COUPLING TO TRANSMITTER OUTPUT AND THE REMAINING TWO FOR AUDIO GAIN AND MODULATOR. THE LAST TWO ARE ALSO USED AS TWO-STAGE AMPLIFIER FOR INTERCOMMUNICATION OR VOICE MODULATION OF THE TRANSMITTER. FOR TONE TRANSMISSION, THE 1000-CYCLE OSCILLATOR FEEDS THE SECOND STAGE.

FuG 17E IS ESSENTIALLY THE SAME AS FuG 17. IT IS INTENDED TO BE USED AS PART OF THE "Y-GERAT" BOMBING AID. WHEN SO USED, THE TRANSMITTER IS THE SAME AS THAT OF THE FuG 17 BUT THE RECEIVER IS MODIFIED TO PERMIT RETRANSMISSION OF RECEIVED SIGNALS. A GROUND STATION MAY THEREBY DETERMINE RANGE BY PHASE COMPARISON OF TRANSMITTED AND RECEIVED MODULATION ENVELOPES.

FuG 17Z, A MODIFICATION OF FuG 17, IS USED ALTERNATIVELY WITH A D/F LOOP FOR HOMING ON TO OTHER AIRCRAFT, GROUND STATIONS, OR SUBMARINES ALSO USING FuG 17. FLOATING BEACONS OPERATING ON THE FuG 17 FREQUENCIES ARE ALSO DROPPED FROM AIRCRAFT TO LOCATE CONVOYS POSITIONS AND MAY BE USED BY AIRCRAFT FITTED WITH FuG 17Z.

INSTRUCTIONAL LITERATURE:

NOMENCLATURE DESIGNATION: (AIRBORNE D/F-RECEIVER) Peil G 4



PEIL G 4 - RECEIVER EZ 4, COMPLETE.

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 0.25-0.4

NUMBER OF CRYSTALS: None.

PRESET FREQUENCIES: Two, remotely selected by motor operating between click stops.

ANTENNA: Oval loop 13" long and 3½" in diameter at the widest part carries 13 turns of Litz wire crosswound in series.

TUNING: (MO or crystal) Main tuning is by 3-gang condenser; fine tuning is provided in the R-F oscillator circuit by an unusual method of permeability tuning where the secondary of an iron-cored transformer in the tuned grid circuit of the oscillator is varied in frequency over 3 kc/s by applying a variable D-C to the primary.

SENSITIVITY: Good: 1 microvolt unmodulated signal applied across 30 ohms gives 5 milliwatts output.

SELECTIVITY: 6 db at 1 kc total band width; 20 db at 2kc; 60 db at 3.5 kc.

POWER SOURCE: Dynamotor U-8 supplies 200 volts 50 milliamperes. Filaments direct from aircraft battery.

SIMILAR SETS: None.

POWER OUTPUT: (WATTS)

TUBES: (TYPE AND NUMBER) 8 RV 12P 2000.

TACTICAL CHARACTERISTICS

USE: For D/F homing. It was originally used for light bombers in the Middle East. Since then it has been used in single-seat fighters. Fitted in Ju 87, in a few Me 109F and Me 109G prior to the introduction of FuG 162.

TYPE OF SIGNAL: CW, tone and voice.

RANGE: (MILES) About 150 with mobile D/F beacon.

TO COMMUNICATE WITH: Airdrome beacons.

TO REPLACE IN PART:

TRANSPORTATION: Airborne

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
Receiver EZ4	11 "	9 1/2"	6"	22 1/2 #
Loop PEIL4	12 3/4"	3 1/2"	-	12 1/2 #
Dynamotor U-8	9 1/2"	8 "	6"	10 #
Junction Box VD3	12 1/2"	11 "	2"	3 #
Tuning Controls FBG4	2 1/2"	5 "	4 1/2"	2 1/2#
Indicator AFN2	2 1/2"	2 1/2"	3 1/2"	1 1/2#
COMBINED WEIGHT OF COMPONENTS:				

REMARKS

This equipment was produced for the homing of light aircraft. It has the appearance of being hurriedly made; it does not compare favorably with other German receivers. It is an 8-tube superheterodyne receiver -- R-F amplifier, local oscillator, 1st detector, I-F amplifier, BFO, 2nd detector, 1st audio and 2nd audio. The fixed D/F loop is made up of two coils of six turns about ½ inch apart and one turn in the center of the loop. All are connected in series to two connections which go to the receiver. The sense antenna consists of a number of lines of metallized paint on the inside of the loop housing. A small switch motor reverses the loop connections with respect to the sense antenna and simultaneously switches two separate condensers across the output. When the aircraft is off course, unequal charging of the condensers causes D-C to flow through the meter connected between them.

PeilG 5 (AIRBORNE D/F-RECEIVER)

NOMENCLATURE DESIGNATION:

INSTRUCTIONAL LITERATURE:

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 0.165-0.4; 0.4-1.0

NUMBER OF CRYSTALS: None

PRESET FREQUENCIES: None.

ANTENNA: Oval loop with powder-iron core. It carries 8 turns of Litz wire connected in series. Sense antenna 6'11" of stainless steel wire.

TUNING: (MO or CRYSTAL) 4-gang condenser.

SENSITIVITY: 15 microvolts for 4 milliwatts output across 4000 ohms.

SELECTIVITY: 26 db at 9 kc total band width 40 db at 22 kc total band width.

POWER SOURCE: Dynamotor U-8

SIMILAR SETS:

POWER OUTPUT: (WATTS)

TUBES: (TYPE AND NUMBER) 6 NF2.

TACTICAL CHARACTERISTICS

USE: In twin-engine and larger aircraft for taking D/F bearings and for homing.

TYPE OF SIGNAL: CW and voice.

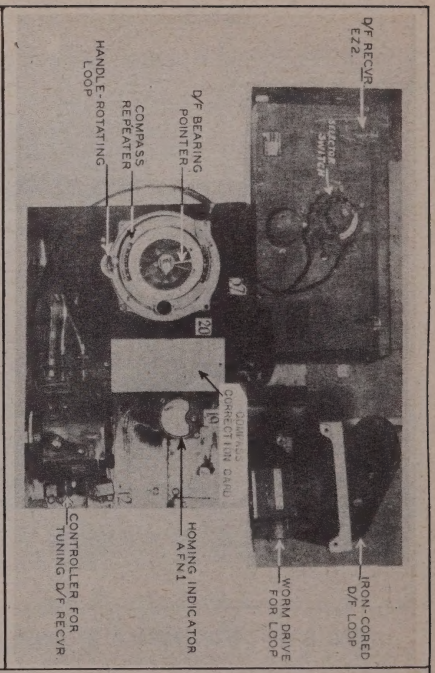
RANGE: (MILES) Up to 250

TO COMMUNICATE WITH: Airdrome beacons.

TO REPLACE IN PART:

TRANSPORTATION: Airborne

Peil G5 (AIRBORNE D/F-RECVR.) COMPONENTS ASSEMBLED



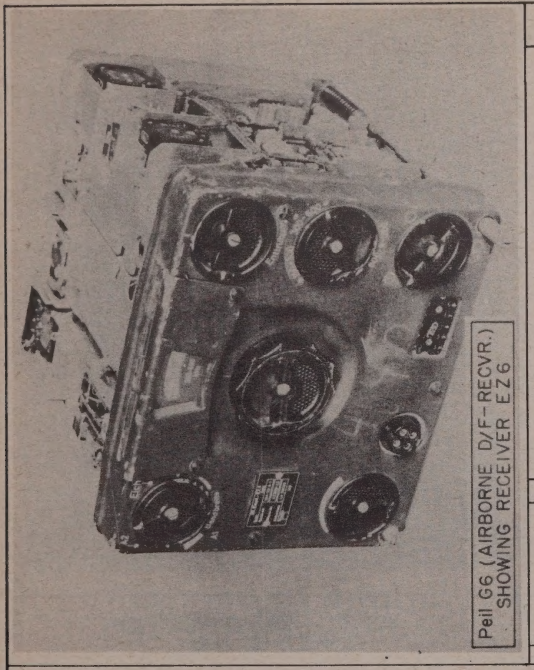
PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
Receiver Type EZ-2	10"	24"	8"	24 #
Loop PRE 6	13"	6 1/2"	2 1/2"	10 #
Antenna Matching Unit				2 #
Dynamotor U-8				5 #
COMBINED WEIGHT OF COMPONENTS:				

REMARKS

This is a Telefunken prewar commercial D/F equipment improved for use by the Luftwaffe and fitted in all twin-engine and larger aircraft since 1939. It is intended for the exclusive use of the navigator for taking D/F bearings and for homing. The receiver EZ2 is a 6-tube, straight type, now obsolescent due to the introduction of the PeilG 6 supergeterodyne, utilizing EZ-6 receiver. The features of the internally stowed, iron-cored D/F loop and the direct display of the bearing on the navigator's compass repeater represented considerable advances in technique at the time of introduction and are still retained with the PeilG 6.

INSTRUCTIONAL LITERATURE:

NOMENCLATURE DESIGNATION: (AIRBORNE D/F-RECEIVER) PeilG 6



PeilG 6 (AIRBORNE D/F-RECVR.) SHOWING RECEIVER EZ6

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 0.15-1.2 IN 3 BANDS AS FOLLOWS: 0.15-0.3, 0.3-0.6. 0.6-1.2.

NUMBER OF CRYSTALS: Two

PRESET FREQUENCIES: None

ANTENNA: Oval former 2½ "X 6" X 12½" with iron powder filling at edges. 14 turns of litz wire connected in series.

TUNING: (MO OR CRYSTAL) Manual

SENSITIVITY: SELECTIVITY:

POWER SOURCE: Dynamotor U-11a

SIMILAR SETS: PeilG 4

POWER OUTPUT: (WATTS)

TUBES: (TYPE AND NUMBER) 7 RV 12P 2000

TACTICAL CHARACTERISTICS

USE: It may be used as a separate receiver or to replace E10L receiver in FuG 10. PeilG 6 is a communications and D/F receiver.

TYPE OF SIGNAL: CW, tone and voice.

RANGE: (MILES)

TO COMMUNICATE WITH: Broadcasting stations and homing beacons.

TO REPLACE IN PART: PeilG 5 and the E10L receiver in FuG 10.

TRANSPORTATION: Airborne.

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
Receiver EZ6	7"	8 1/2 "	9 1/2 "	20 #
Loop PRE6	13"	6 1/2"	2 1/2 "	10 #
Antenna matching unit				2 #
Course meter AFN2	2 1/2"	2 1/2"	3 "	1/2 #
Dynamotor U-11a	6 1/2"	10 "	4 1/2 "	11 #
COMBINED WEIGHT OF COMPONENTS:				

REMARKS

The PeilG 6 is a modern replacement for PeilG 5 and is still in process of introduction. It is similar to PeilG 4 in theory and design, but shows none of the haste of production noticeable in that set and is well designed from all points of view. It is installed either as a separate D/F receiver in addition to FuG 10 for use by the navigator or else it takes the place of the long-wave receiver E10L in FuG 10 and performs the dual function of direction finding and communication.

An unusual feature of the receiver is the use of two crystals for stabilizing the intermediate frequency of 130 kc/s and the BFO at 129 kc/s. This produces a 1000-cycle audio frequency for D/F work.

The antenna is rotated by an electric motor which may be used by a hand-operated, reversing switch for finding the minimum aurally, or controlled automatically to rest in the minimum position by using the receiver output to govern the field of a Ward-Leonard generator. The amplifier V6 is used to amplify the receiver output for this purpose by the novel method of applying the receiver D-C output to a vibrator unit, thus amplifying the resultant A-C and then rectifying the current for application to the generator.

X Gerät (AIRBORNE RECEIVER)

NOMENCLATURE DESIGNATION:

INSTRUCTIONAL LITERATURE:

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 66.5-75.0 (TWO RECEIVERS, SAME RANGE).

NUMBER OF CRYSTALS: NONE.

PRESET FREQUENCIES: ONE CLICK STOP.

ANTENNA: TWO ANTENNAS EACH CONSISTING OF A QUARTER-WAVE VERTICAL ROD.

TUNING: (MO OR CRYSTAL) MANUAL.

SENSITIVITY: 1 MICROVOLT INPUT FOR 50 MILLIWATTS OUTPUT 15 DB S/N RATIO.

SELECTIVITY: 40 DB DOWN FOR 456 KC TOTAL BAND WIDTH WITHOUT REGENERATION AND 73 KC WITH REGENERATION. 20 DB ± 150 C/S EITHER SIDE OF 2000 C/S.

POWER SOURCE: SPECIAL X-GERÄT POWER UNIT.

SIMILAR SETS:

POWER OUTPUT: (WATTS)

TUBES: (TYPE AND NUMBER) 20 RV 12 P 2000

TACTICAL CHARACTERISTICS

USE: IN BOMBER AIRCRAFT FOR BLIND BOMBING ON CROSS BEAMS. IT IS FITTED IN HE 111 H.

TYPE OF SIGNAL: DOT-DASH, LEFT-RIGHT BEAMS.

RANGE: (MILES) ABOUT 250.

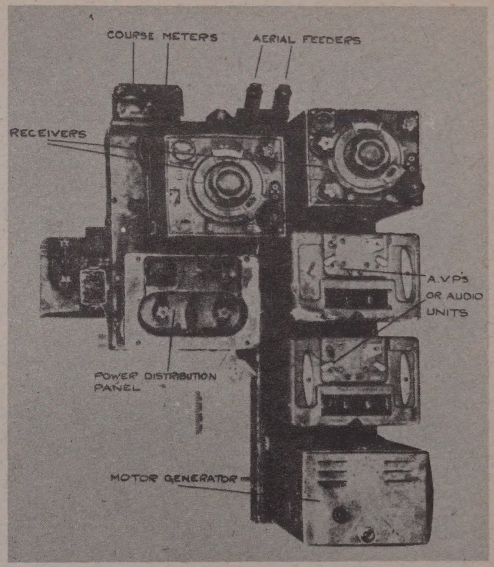
TO COMMUNICATE WITH: GROUND STATION.

TO REPLACE IN PART:

TRANSPORTATION: AIRBORNE.

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT

COMBINED WEIGHT OF COMPONENTS:



X GERAT (AIRBORNE RECEIVER) MOUNTED ON PANEL.

REMARKS

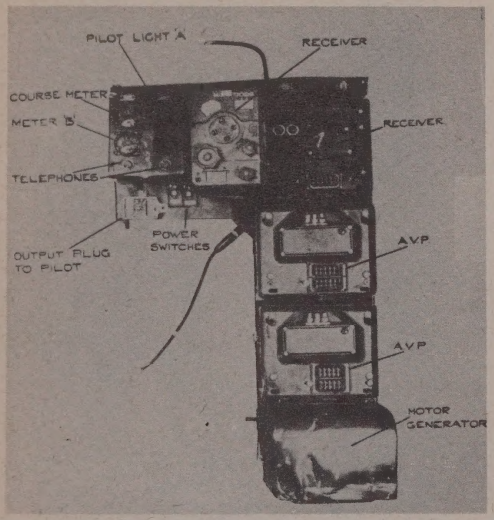
THE X-GERÄT IS A SPECIALIZED BLIND-BOMBING DEVICE. IT CONSISTS OF TWO RECEIVERS, TWO QUARTER-WAVE ANTENNAS, AUDIO UNITS, VISUAL INDICATORS AND THE X-GERÄT CLOCK. IT OPERATES ON THREE MAIN BEAMS. ONE, THE PILOT'S BEAM, LAID OVER THE TARGET AS A ROUTE INDICATOR, IS CROSSED BY TWO OBSERVER'S BEAMS WHICH MEASURE OFF A KNOWN DISTANCE DISTANCE (10 KMS OR 15 KMS) FROM THE TARGET. DOT OR DASH SIGNALS RECEIVED ON ONE OR THE OTHER SIDE OF THE PILOT'S BEAM ARE INTERPRETED IN THE AUDIO UNIT ANALYZER AS POSITIVE OR NEGATIVE D-C CURRENT IN A COURSE METER. THE SECOND RECEIVER OPERATES ON THE FREQUENCY OF BEAMS ARRANGED TO CROSS THE COURSE BEAM AT APPROXIMATELY 90°. WHEN THE OBSERVER GETS THE SIGNAL (EITHER AURALLY OR ON THE CROSS-BEAM METER) THAT THE AIRCRAFT IS CROSSING THE CENTER OF THE BEAM, HE STARTS THE CLOCK MANUALLY. WHEN THE AIRCRAFT CROSSES THE SECOND BEAM, HE PUTS THE INFORMATIUN INTO THE CLOCK; THE TIMING HAND WHICH HAD BEGUN TO MOVE WHEN THE CLOCK WAS STARTED NOW STOPS AND ANOTHER HAND STARTS. THE CONNECTION MADE WHEN THE TWO HANDS MEET RELEASES THE BOMB.

LATEST INFORMATION INDICATES THAT THIS SET DID NOT ADVANCE BEYOND THE PROTOTYPE STAGE.

84-T9088&3CD-75

INSTRUCTIONAL LITERATURE:

NOMENCLATURE DESIGNATION: (AIRBORNE RECEIVER) Y Gerät



Y GERÄT (AIRBORNE RECEIVER) COURSE PANEL "L" TYPE

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (MC) 42.1-47.9

NUMBER OF CRYSTALS: NONE

PRESET FREQUENCIES: FOUR CLICK STOPS ON TUNING KNOB.

ANTENNA: VERTICAL ROD ABOVE FUSELAGE AND RETRACTABLE ANTENNA BELOW, MOTOR DRIVEN. THE RETRACTABLE ANTENNA IS USED FOR RETRANSMITTING AND EXTENDS THROUGH THE FLOOR OF THE AIRCRAFT WHEN THE UNDERCARRIAGE IS RAISED.

TUNING: (MC OR CRYSTAL) MANUAL (MC)

SENSITIVITY: GOOD: 30 MICROVOLTS ACROSS 50-OHM INPUT TO GIVE 5 MILLIWATTS OUTPUT 30% MODULATION.

SELECTIVITY: 6 DB FOR 25 KC TOTAL BAND WIDTH.

POWER SOURCE: DYNAMOTOR U-17 SUPPLIES 450 VOLTS 165 MILLIAMPERES, 165 VOLTS, 5 MILLIAMPERES FOR TRANSMITTER AND 210 VOLTS AT 90 MILLIAMPERES FOR RECEIVER.

SIMILAR SETS: NONE

POWER OUTPUT: (WATTS) 10

TUBES: (TYPE AND NUMBER) DEPENDS UPON THE TYPE OF RECEIVER USED.

TACTICAL CHARACTERISTICS

USE: IN BOMBER AIRCRAFT FOR AIR-TO-GROUND COMMUNICATION AND BOMBING CONTROL. THE GROUND STATION EMPLOYS THE "BENITO" TECHNIQUE WHICH USES ONLY ONE BEAM LAID OVER THE TARGET AS A ROUTE AND TARGET INDICATOR.

TYPE OF SIGNAL: RECEIVES AND TRANSMITS VOICE OR TONE FOR COMMUNICATION WITH GROUND. RECEIVES TONE FROM BEAMS FOR DISPLAY ON COURSE METER. RECEIVES AND RETRANSMITS TONE FOR RANGE MEASUREMENT BY GROUND STATION.

RANGE: (MILES) UP TO 250.

TO COMMUNICATE WITH: GROUND STATION.

TO REPLACE IN PART:

TRANSPORTATION: AIRBORNE

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
RECEIVER E-17-X8	8"	5 1/2 "	8 1/4"	10 #
TRANSMITTER AND RECEIVER FUG 17E	8"	15 "	8 1/4"	26 1/2 #
DYNAMOTOR U-17	8"	10 "	9 "	15 #
COMBINED WEIGHT OF COMPONENTS:				

REMARKS

THE Y-GERÄT IS A LATER DEVELOPMENT THAN THE X-GERÄT, AND ALTHOUGH THE TECHNIQUES INVOLVED ARE SOMEWHAT SIMILAR, THE Y-GERÄT EMPLOYS ONLY ONE INSTEAD OF THE THREE BEAMS THAT ARE CHARACTERISTIC OF THE EARLIER EQUIPMENT. WITH THE Y-GERÄT, THE DISTANCE THE AIRCRAFT HAS TRAVELED ALONG THE BEAM - AND HENCE ITS PROXIMITY TO THE TARGET - IS CALCULATED BY A "BENITO" GROUND CONTROL STATION. THIS STATION GETS THE RANGE OF THE AIRCRAFT BY MEANS OF A MODULATED SIGNAL TRANSMITTED FROM THE GROUND STATION AND RETRANSMITTED BACK TO THE GROUND STATION BY THE AIRCRAFT ON A DIFFERENT FREQUENCY. THE GROUND STATION COMPUTES THE DISTANCE ON THE BASIS OF THE TIME TAKEN FOR THE SIGNAL TO RETURN. THE GROUND STATION PLOTS THE AIRCRAFT POSITION AND AT THE RIGHT MOMENT GIVES THE ORDER TO RELEASE THE BOMB.

THE EQUIPMENT IS IN TWO SEPARATE PARTS - A COURSE PANEL AND A RANGE PANEL. THE COURSE PANEL CARRIES A FUG 17 RECEIVER (E-17) FOR RECEIVING THE BEAM AND PASSING THE SIGNAL TO THE AVP WHICH IS A SIGNAL ANALYZER FOR OPERATING THE COURSE METER. THE RANGE PANEL CONSISTS OF THE FUG 17 TRANSMITTER AND RECEIVER UNIT COMPLETE, ARRANGED TO FURNISH AIR-TO-GROUND VOICE COMMUNICATION IN THE NORMAL MANNER AS WELL AS TO PERFORM A FUNCTION OF THE Y-GERÄT. THE RADIO OPERATOR IS RESPONSIBLE FOR THIS PART OF THE EQUIPMENT, PRESSING A KEY AT INTERVALS TO ENABLE SPECIAL GROUND STATIONS TO PINPOINT THE AIRCRAFT BY COMPARING THE PHASE OF A MODULATION ENVELOPE TRANSMITTED BY THE GROUND STATION WITH THAT RECEIVED AFTER RETRANSMISSION FROM THE AIRCRAFT.

AN OUTSTANDING FEATURE OF THE Y-GERÄT IS THE USE OF THE OUTPUT FROM THE COURSE PANEL TO CONTROL THE AIRCRAFT BY MEANS OF AN AUTOMATIC PILOT AND A CONTROL BOX LKZG. THIS CONTROL BOX PROVIDES AN OVERRIDING CONTROL FOR FLYING THE AIRCRAFT BY OPERATING A CHANGE-OVER SWITCH.

THERE IS EVERY INDICATION THAT THE GERMANS LIKE THIS SYSTEM SINCE THERE HAVE BEEN SEVERAL ADAPTATIONS OF IT.

Fpruf. d1 (FREQUENCY TESTER) (MISC. EQUIP.)	NOMENCLATURE DESIGNATION:	INSTRUCTIONAL LITERATURE:

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: 28 FIXED FREQUENCIES NUMBERED 151-178 IN THE ULTRASHORT-WAVE RANGE. ACTUAL FREQUENCY RANGE IS 120-156 MC.

NUMBER OF CRYSTALS: ONE

PRESET FREQUENCIES:

ANTENNA:

TUNING: (MO OR CRYSTAL)

SENSITIVITY:

SELECTIVITY:

POWER SOURCE: STORAGE BATTERY 2 B19 AND ONE 90-VOLT BATTERY.

SIMILAR SETS:

POWER OUTPUT: (WATTS)

TUBES: (TYPE AND NUMBER) 1 SD1A

TACTICAL CHARACTERISTICS

USE: FOR FREQUENCY CALIBRATION OF THE FIELD RADIOTELEPHONY SET FELFU. A1. PRIMARILY; ALSO FOR FELDFU. B AND C.

TYPE OF SIGNAL:

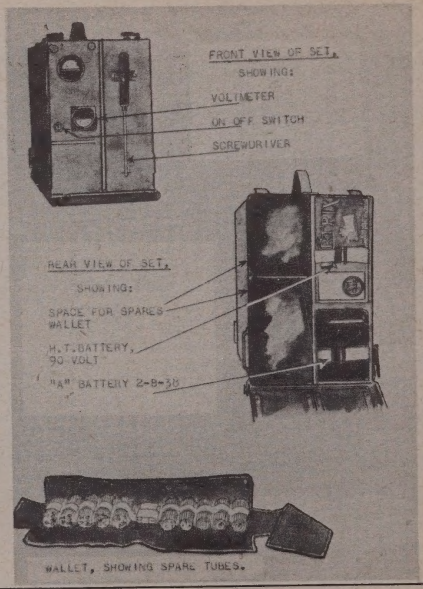
RANGE: (MILES)

TO COMMUNICATE WITH:

TO REPLACE IN PART:

TRANSPORTATION: ONE MAN PACK.

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
OVER-ALL WEIGHT 29 #				
COMBINED WEIGHT OF COMPONENTS:				



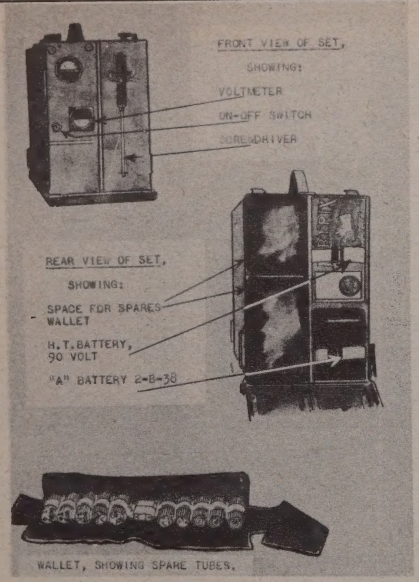
FPRUF. d1 (FREQUENCY TESTER)

REMARKS

THE FPRUF. D1 IS INCLOSED IN A METAL CONTAINER WITH HANDLE AND STRAPS FOR CARRYING IT ON THE SHOULDERS. A SCREWDRIVER IS CLIPPED TO THE SIDE OF THE OPERATING PANEL. THE STORAGE BATTERY AND A 90-VOLT BATTERY ARE IN ONE COMPARTMENT AND IN THE OTHER TWO COMPARTMENTS THE FOLLOWING ITEMS ARE STOWED: ONE NARROW WALLET CONTAINING TEN SD 1A TUBES, ONE WIDE WALLET CONTAINING FIVE RV 2P 800 TUBES AND FIVE RL 2 P 3 TUBES, WITH TWO THROAT MICROPHONE CAPSULES KMK.A, ONE THROAT MICROPHONE KMF.B, AND ONE PAIR OF HEADPHONES DFH.A IN SEPARATE BAGS.

INSTRUCTIONAL LITERATURE:

NOMENCLATURE DESIGNATION: (MISC. EQUIP.) Fre. Pr. G. g. (FREQUENCY TESTER)



FRE. PR. G. g. (FREQUENCY TESTER)

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc)

NUMBER OF CRYSTALS: ONE, 500 KC/S, REPLACEABLE.

PRESET FREQUENCIES:

ANTENNA:

TUNING: (MO OR CRYSTAL)

SENSITIVITY: SELECTIVITY:

POWER SOURCE: THE FREQUENCY TESTER OBTAINS ITS OPERATING VOLTAGES FROM THE SENDER-RECEIVER G THROUGH A 3-CORE CABLE.

SIMILAR SETS:

POWER OUTPUT: (WATTS)

TUBES: (TYPE AND NUMBER) ONE RV 2.4 P 700

TACTICAL CHARACTERISTICS

USE: FOR FREQUENCY CALIBRATION OF PACK WIRELESS SET TORN. FU. G

TYPE OF SIGNAL:

RANGE: (MILES)

TO COMMUNICATE WITH:

TO REPLACE IN PART:

TRANSPORTATION: IT CAN BE HAND CARRIED.

PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
OVER-ALL WEIGHT				4 1/2 #
COMBINED WEIGHT OF COMPONENTS:				

REMARKS

THE FREQUENCY TESTER FRE. PR. G. G CARRIED IN A WOODEN CASE WITH HINGED LID AND CARRYING STRAP, IS USED TO TEST THE FREQUENCY OF THE PACK SET FU. G. THE TESTER HAS ONE TUBE AND ONE CRYSTAL. JOINTED TO THE UNIT ARE ONE POWER CONNECTOR CABLE WITH 3-WAY PLUG AND ONE ANTENNA CABLE WITH ANTENNA CONNECTOR. THERE IS ALSO A 4-WAY CONNECTOR CABLE 15½" LONG FITTED WITH A ROUND 4-PIN PLUG AND 4-WAY PLUG SOCKET FOR CONNECTING THE PACK SET G (REMOVED FROM CASE) TO ITS STORAGE BATTERY.

Fremes a (FREQUENCY METER) (MISC. EQUIP.)

NOMENCLATURE DESIGNATION:

INSTRUCTIONAL LITERATURE:

TECHNICAL CHARACTERISTICS

FREQUENCY RANGE: (Mc) 28.5 KC/S TO 3L MC/S IN 20 RANGES

NUMBER OF CRYSTALS: NONE

PRESET FREQUENCIES: NONE

ANTENNA: ANY SHORT LENGTH OF WIRE

TUNING: (MO OR CRYSTAL)

SENSITIVITY: SELECTIVITY:

POWER SOURCE: 3 BATTERIES OF DIFFERENT VOLTAGE: FOR LOW FREQUENCY, 4-4.8 VOLTS, 0.5 AMPERES; FOR HIGH FREQUENCY, 135-150 VOLTS, 15-25 MILLIAMPERES; FOR GRID BIAS 3 VOLTS.

SIMILAR SETS:

POWER OUTPUT: (WATTS)

TUBES: (TYPE AND NUMBER) 4--1 RES 094, 1 RE 134W AND 2 RE 134

TACTICAL CHARACTERISTICS

USE: FOR CALIBRATING TRANSMITTERS AND RECEIVERS AND MEASURING FREQUENCIES. IT IS SUITABLE FOR USE BY OUR OWN TROOPS FOR ROUGH CALIBRATION CHECKS AND FREQUENCY MEASUREMENTS WHERE PRECISION IS NOT ESSENTIAL.

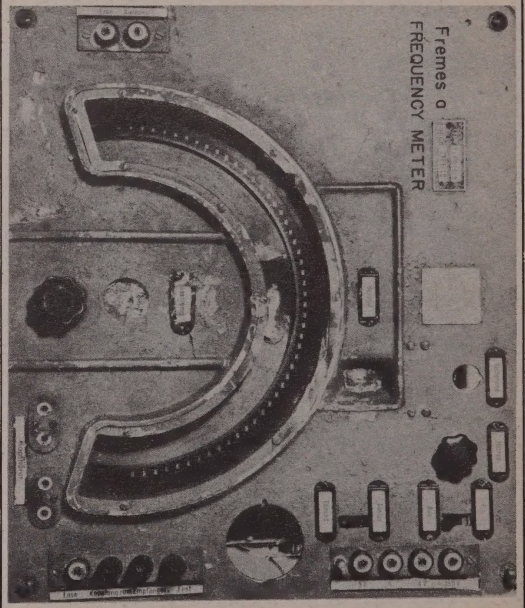
TYPE OF SIGNAL: CW OR 500-CYCLE MODULATED SIGNAL.

RANGE: (MILES)

TO COMMUNICATE WITH:

TO REPLACE IN PART:

TRANSPORTATION: VEHICULAR



PRINCIPAL COMPONENTS	HEIGHT	WIDTH	DEPTH	WEIGHT
COVER & COMPONENTS	10 1/2"	16 1/2"	13 1/2"	44#

COMBINED WEIGHT OF COMPONENTS:

REMARKS

FREMES. A IS A HETERODYNE FREQUENCY METER INCLOSED IN A BOX THAT STANDS FLAT ON FOUR RUBBER FEET. THE CHASSIS AND FRONT PANEL ARE DIE-CAST IN ONE PIECE WITH A FLANGE THAT FITS OVER EDGE OF BOX. ON FRONT PANEL A SEMICIRCULAR SCALE 10" IN DIAMETER AND DIVIDED INTO 500 DIVISIONS IS PROVIDED WITH A MOVABLE DIAL AND VERNIER READING TO 1/10 OF A DIVISION. THE SCALE IS NOT ILLUMINATED.

THE ANTENNA IS CAPACITY COUPLED TO A SINGLE TUNED TETRODE HIGH-FREQUENCY STAGE WHICH IS LOOSELY COUPLED TO A TRIODE REINARTZ OSCILLATOR DETECTOR. THE GRID IS TAPPED DOWN A POTENTIOMETER AND THIS IS TAPPED DOWN THE TUNED CIRCUIT.

OF THE FOUR TUBES, THE RES 094 IS USED AS A HIGH-FREQUENCY AMPLIFIER FOR EXTERNAL SIGNALS, THE TWO RE 134 TUBES ARE USED AS 1-F AMPLIFIER/1-F OSCILLATOR AND AS 1-F AMPLIFIER/PHONES OUTPUT, AND THE RE 134 AS OSCILLATOR DETECTOR.

TWENTY SETS OF COILS ARE ARRANGED ON CERAMIC SPOOLS ON TWO WHEELS. BAND SWITCHING IS ACCOMPLISHED BY SWITCHING THE WHEELS.

EQUIPMENT IS NOT READILY PORTABLE BECAUSE OF THE 3 SEPARATE BATTERIES AND LEADS; IT IS NOT BUILT TO WITHSTAND VIBRATIONS AND SHOCKS.

A	nton	**N**	ordpol
Ä	rger	**O**	tto
B	ertha	**Ö**	dipus
C	äsar	**P**	aula
Ch	arlotte	**Q**	uelle
D	ora	**R**	ichard
E	mil	**S**	iegfried
F	riedrich	**T**	heodor
G	ustav	**U**	lrich
H	einrich	**Ü**	bel
I	da	**V**	iktor
J	ulius	**W**	ilhelm
K	onrad	**X**	anthippe
L	udwig	**Y**	psilon
M	artha	**Z**	eppelin
	Sch ule		

GERMAN PHONETIC ALPHABET

THE ABOVE PHOTOGRAPH OF METAL PLATE ATTACHED TO A RECENTLY CAPTURED GERMAN FIELD TELEPHONE, SHOWS THE PHONETIC ALPHABET CURRENTLY USED BY GERMAN SIGNAL PERSONNEL IN VOICE COMMUNICATIONS.

IT IS INTERESTING TO NOTE THAT MANY ITEMS OF GERMAN RADIO EQUIPMENT ARE GIVEN NICKNAMES FROM THIS PHONETIC ALPHABET, FOR EXAMPLE, THE "FU 2" SET IS REFERRED TO AS "DORA," THE FU 9," "BERTHA," ETC.

THIS ALPHABET MAY BE OF USE TO COMMUNICATIONS PERSONNEL OF THE ALLIED FORCES ENGAGED IN INTERCEPT WORK.

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1000 W.S.B	(" ")	13
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